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## The Condition of Modern Architecture

By Leslie W. Devereux



Bush Building, New York.

TWO thoughts stand out as clear and important: the similarity of modern conditions of architecture with those of the Roman republic, and the individual tendency of modern design.

The resemblance of modern life and thought to the Roman ideal, in the time of the republic, is very striking. Conditions both of life and thought have, of course, improved wonderfully. Yet the ideal remains essentially the same. Modern business methods impose conditions upon architecture just as the Roman political system imposed them in the days of the republic. As Mr. Van Brunt points out,\* it is not common for a man to incommode himself nowadays for the sake of an architectural idea. "The merchant requires that the first story of his shop or warehouse shall be of glass; the formulas of Vitruvius, Vignola, Palladio, and all the

most venerable traditions and usages of art must yield to this inexorable demand; the building committee insists that their church must be a place where all may see and hear the speaker, and that accommodation must be provided on the first floor for vestry, Sunday-school, class-rooms, kitchen, and all the social and religious exigencies of their style of worship and service, although Pugin would faint with horror at the result. Yet it is out of just such prosaic exactions as these that our architecture must be developed. We must have narrow façades on our streets, and these must be built to the skies and crowded with windows. We can find no historic precedent for such things. We must accept the conditions as they are given us and create our architecture accordingly."

Of similar conditions existing in the time of the Roman republic, M. Viollet-le-Duc says: "It was indifferent to the Roman what order or cornice or moulding the architect chose to apply to his building; but the moment he undertook the reason, to establish certain principles by virtue of which he came in contact with the will of the magistrate, the moment, for example, he refused to give three stories to a building whose proportions he believed better adapted to two, whatever authority he might invoke, whatever good reason he might urge, the magistrate would at once direct him to obey and not to amuse himself by discussing the

principles of his art with him, a Roman, who admitted no other reasons or authorities than those of state."

Mr. Van Brunt says that it is doubtless to this quality in our people that we are indebted for the most characteristic expressions in our work. "A public like ours, trained in habits of business, is positive and exacting, and at least has the virtue of compelling the architect to fulfil all such practical requirements in a straightforward and common-sense manner." To this quality may be attributed much of our peculiar and appropriate forms of construction, our novel use of steel, hollow tile, reinforced concrete, terracotta, stucco, and other materials, as well as our methods of construction. Similarly, to this identical quality is the Roman indebted for much of his peculiar type of construction, for the use of rubble masonry cores, tied together with concrete and covered with a veneer of marble or stone to which the architectural forms were applied.

It may be well to mention here the new "Zoning Law," recently enacted in New York, which, it is almost unanimously predicted, will do much to improve both the skyline and the architecture of New York City. This law provides that, in certain districts, a building can only be built up a certain distance without being "set back" from the lot line in order to admit light, to penetrate to the street. The height varies in different districts, depending upon the general character of its buildings, and it is always a multiple of the width of the street, varying from the street width to two and one-half times the street width. Furthermore, the laws restrict certain districts to certain "uses" (residence, business, or factory, for example), thus tending to make these localities more uniform in the character and appearance of their building. The "set-back" restrictions will also do much to add interest to the upper stories of high buildings, and to eliminate unfinished blank walls.

Another point of resemblance between modern architectural conditions and those of the Romans is the "dangerous superficiality of thought and work, arising from a deficient education in art and from a want of leisure," as Mr. Van Brunt expresses it. Mr. Van Brunt thinks that we can and ought to control this superficiality of thought and work, whether arising from want of education or from the atmosphere of bustle and haste in which we live; and he thinks that the organization of the American Institute of Architects is the first step toward combating this evil. However, in order to be really effective, he thinks that it should increase its membership, spread its influence farther, and make itself more universally felt. The numerous state societies and the registration laws also operate to decrease this evil.

\*Discourses on Architecture by Eugène Emmanuel Viollet-le-Duc; translated with an introductory essay by Henry Van Brunt.



Still another point of resemblance between the Romans and ourselves is the indifference or absence of sympathy in the public for the just expression of beauty or fitness in buildings. Mr. Van Brunt attributes this partially to the atmosphere of haste in which we live, which, he claims, is distinctly detrimental to the development of good style, and partly to the lack of education on the part of the public in matters of art. It may also be attributed to the material and realistic tendency of our age, to the absence of feeling and sympathy either for art, beauty, or the development of the ideal, whether politically, intellectually, or morally. However, conditions have also been improving in this respect in the last twenty years.

We are like the Romans in that we disdain everything which does not perform a useful function in our great business system, which takes the place of the Roman political system. We, like the Romans, trouble ourselves little to know whether a certain form is in harmony with the true principles of art (which was the great concern of the Greek, Byzantine, and mediæval architects). We care not to discuss, like the Greeks, whether our opinions are logically deduced. We, like the Romans, again, do not delight in outline, a play of light and shade. With the Romans we demand but one thing, that our architecture shall be a symbol of our grandeur and success; and, more especially, that it shall agree with our business system and be a useful work, exactly filling a prescribed programme.

These facts do not, of course, apply to all types of construction, nor to the works of all architects. There are certain buildings, such as residences and churches, which are largely immune from these conditions. Similarly, there are certain architects high up in the profession who have a deep regard for harmonious forms, logical construction, outline, light and shade, and other concerns of true art. And it is precisely because they do concern themselves with these matters that they stand so high in the profession. But, taking a general average of conditions, our similarity in these respects to the Romans is, I think, evident. And, furthermore, the Romans had as many exceptions as ourselves to these conditions, and it is in these very exceptions that we find the best examples of their art.

The Roman found among the Greeks superior workmen and he imported them, hired them, and permitted them to decorate his monuments according to their own taste, but recognizing the artist only as a workman. We find many of our artists among naturalized foreigners, or men of foreign birth or descent, who, although essentially American in their affiliations, nevertheless retain some of the foreign love of art and depth of feeling. A list of our artists, more particularly our painters and sculptors, presents an appalling preponderance of foreign-sounding names. And we also, in many cases, are inclined to hire them as workmen rather than as artists.

Conditions in this respect have also improved enormously in the last twenty years. Americans are beginning to take a much greater interest in American art, and the number of American-born men and women who have taken up some form of art as a profession has increased wonderfully in the last quarter of a century.

Lastly, and most important of all, our architecture resembles that of Rome in that it is only a shell or a clothing of the actual structural form. To use M. Viollet-le-Duc's comparison between Greek and Roman architecture, "in Greek architecture the visible exterior form was but the result of construction; it may be compared to a naked man, the surface of whose body is but the consequence of his needs, of the structure of his organs, of the mutual relations

and positions of bones, functions, and muscles. His beauty increases when all parts of his body are exactly fitted to their several purposes—nothing more nor less. But Roman architecture is man-clothed; the man is one thing, his clothing is another; this clothing may be good or bad, rich or poor, well or badly cut, but it is not a part of his body; if well-made and beautiful, it ought to be studied; but if it interferes with his movements, if there is neither grace nor reason in its forms, it should be disregarded."

Our architecture, in general, corresponds to this type of building. It is an exterior shell or garment over the form beneath. And, like Roman architecture, it has its true, real, useful system of construction, combined with a view of answering certain definite purposes; it has also its envelope, its decoration, which is independent of the structure, as clothing is independent of the man. The Romans, as practical people, attached but a secondary importance to this clothing, this decoration; they wanted it simply to cover and do honor to their monuments; they cared little whether it was reasonably applied or not, whether or not it indicated exactly the essential forms of construction of the edifice, and illustrated those forms. The Roman was above, or rather did not sympathize with or comprehend the reasoning of the Greek.

"The Roman, it must be understood," says M. Viollet-le-Duc, "was not parsimonious; but he was economical, that is to say, he strove to avoid waste, both of land and of material. He did not comprehend that artistic feeling which prompted the Greek and mediæval builder to work for their own honor; but, according to his understanding, the sculptor he employed labored for public good and to celebrate the munificence of the Roman benefactor. He did not call the artist to his aid till the material purpose of the monument was attained, and merely as a *dresser* of the work; and with reference to these finishing processes, his concern was not for delicacy or refinement of detail, but rather that his monument should be covered with precious marbles, rich in color; and, with the taste of the *parvenu*, he esteemed these marbles in proportion to their rarity and difficulty of working."

We may easily find parallel opinion to-day harmonizing with this conception of the functions of architecture. And not so many years ago it may be said that it was almost the general view of the country.

The Romans, in order to cover their shell of construction and to decorate their monuments, adopted Greek forms and detail for this purpose. "Their ideas of art," says M. Viollet-le-Duc, "were those of pirates, who, with barbarous and tasteless pride, adorn themselves with foreign and incongruous spoils." But if we note that the Romans borrowed from the Greeks, we should also consider how their peculiar genius modified what they borrowed. Of the three Greek orders, the Doric, the Ionic, and the Corinthian, the Romans preferred the Corinthian, since they cared less for purity of form than for ostentation. He preferred to the carefully studied sweetness and purity of the Greek lines, abundance of sculpture; he was rich and he desired to appear so. The Corinthian order became soon the only one applied by the Romans to their religious edifices. But, as the small size of most of the Greek temples was hardly consistent with the genius of the Romans, who, from the earliest times of the empire, were prone to cover their cities with immense edifices, they exaggerated the dimensions of the Greek Corinthian order; and this, like the other orders, they soon imbued with their peculiar spirit as constructors. The Roman had no time to waste in studying purity of contour or unprofitable refinements; he desired absolute symmetry. Not



only was this his taste, but it was much simpler to carry out and took much less time and effort than the careful refinements of the Greeks. But it is important to observe that the Roman, who thus applied the law of symmetry to the forms of his art, that is, to the envelope of his monuments, would boldly and intelligently free himself from its restraint when it interfered with the satisfaction of a material need, as in the practical arrangements and details of his works of public utility. This is a salient point in the character of Roman architecture.

"Exaggeration," says M. Viollet-le-Duc, "is the great stumbling-block in the way of true grandeur. This error the Romans scrupulously avoided. They were grand but simply so, without effort or refinement. And thus, between the two extremes of daring and of moderation, of ambition and of common sense, their taste found characteristic expression."

Our architecture, in general, corresponds to the Roman idea. It is a shell or envelope over the structural form beneath. And, like the Romans, who borrowed Greek forms of trabeated architecture to cover their structural forms of arcuated construction, we borrow promiscuously from all the styles that have gone before us, and clothe our buildings in raiment inspired from Egyptian, Greek, Roman, Byzantine, Lombard, Romanesque, Gothic, Renaissance, and other precedent. And, still like the Romans, we have developed these styles, to a greater or less extent, into an original treatment or expression of them which is peculiar and appropriate to our thought, life, and conditions. Just as the Romans developed from the Greek forms a style of their own, appropriate to the expression of the grandeur and power of their political system, so are we developing from previous styles an expression or style—or a multiplicity of them—which is the symbol of the grandeur and success of our business system.

This, then, is our ideal as expressed in our thought, life, and art; and, whether we like it or not, it is what will go down to posterity as the monument of our civilization, the representation of our state of culture, commerce, and morals.

The second thought which stands out in connection with modern architecture is that architecture is becoming more and more an individual art; that is to say, the artistic side of it is becoming so, for our constructive forms, as we have just pointed out, are dictated largely by the needs of our civilization. But the artistic side, which we have shown has, in general, become divorced from structure, is now largely a matter of individual genius and ability.

With the invention of printing and photography, and the increased facilities of travel, it is now possible for a man in almost any part of the world to keep in touch with the conditions and thought of any other locality. It is possible,

by books and photographs, to study the art or life of any previous epoch, and it is comparatively easy to travel to almost any land to verify these studies. Through newspapers, magazines, books, photographs, moving-pictures, and plays, the thought of any country may be easily transported to any other. Thus opinion tends to become universal, and the thought of any one country on a given subject is apt to be that of any other, except for certain nuances

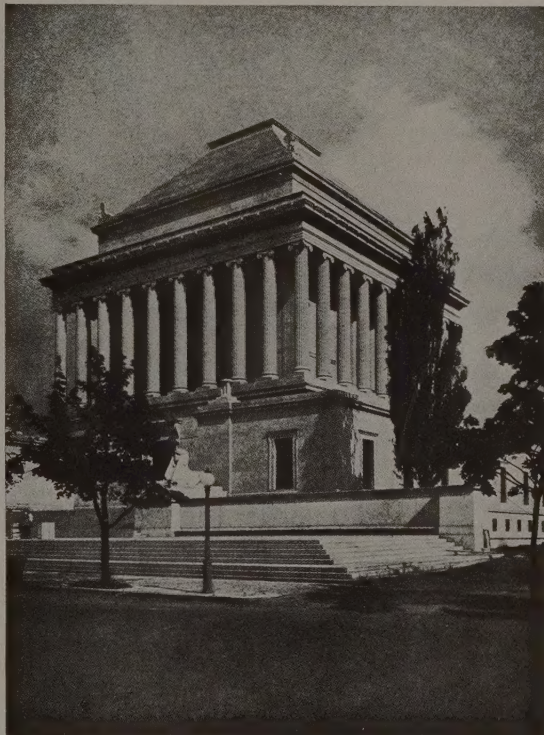
of taste and customs and requirements. The conception of a certain type of building, for example, in one country is likely to be that in any other, with the exceptions just mentioned. Under these conditions it is no longer possible to hope for any truly national school of art, which will not have its exponents and admirers in other lands, and which will be an expression only of its own national feeling. The opportunities of learning are universal, and, to all practical purposes, equal. It thus devolves upon the individual to educate himself and to acquire as much or as little learning as he desires; upon him depends the extent to which he shall study and understand his art, and the experience and knowledge he shall acquire in its practice.

Upon these two considerations, then, depends the development of modern architecture: first, upon the fact that, in general, construction is divorced from art, and architecture is a mere envelope or

decoration, more or less independent of the structure but still relying on it to the extent that it must be an appropriate and beautiful dress, not hampering its forms of construction and enhancing rather than detracting from the structural or functional beauty; and, second, that the extent to which this is accomplished has become the concern of an individual artist rather than of a national school.

With this picture in our mind, we can discern more readily the ideal of modern architecture. It is to develop these forms to the utmost beauty; to make them express, as far as possible, the requirements and uses of the building, its structural conditions, its functional forms, and to enhance them to their greatest possible development both in grace and beauty. To accomplish this, it is necessary not only to satisfy the requirements of use and structure, but also to perfect the beauty of proportions, form, and color. And in doing this, the development of the true expression of the material employed in proportions, form, and color will in the future, as it has done in the past, lead to the finest possible development of our modern ideal.

M. Viollet-le-Duc bears out this thought in saying that "by using such forms as shall most naturally and inartificially express the qualities and capacities of the materials we employ, by using cast-iron forms for cast iron and wrought-iron forms for wrought iron, by having appropriate distinctions of treatment for a form of granite, of sandstone, of marble, of brick, and of wood, we shall not only open a



Scottish Rite temple, Washington, D. C. John Russell Pope, Architect.



vast and inexhaustible field for variety and novelty of design, but must at last succeed in attracting the sympathy and appreciation of the public for an art which, by its false and arbitrary standards of criticism, has so long been alienated from them."

As regards truth of expression in architecture, Professor John Erskine, in a series of lectures at Columbia University on "The Materials of Poetry," states that truth in poetry is measured by its expression of an ideal rather than of material facts. By ideals is meant genuine and real aspirations, not fanciful dreams. Architecture, says Professor Erskine, is great in so far as it expresses its ideal purpose. And originality in architecture consists not so much in in-

venting novel forms, as in applying and adapting traditional forms to new uses and requirements. Architecture is original if it expresses, or helps to express, a new thought appropriately and if it is truthful to type and to requirements. Truthfulness to type and to requirements begets both great art and originality. And architecture is the most truthful and ideal of arts.

In proportion, then, as we apply our knowledge and love, our intellectual and spiritual energy to the achievement of this ideal, in that ratio will our results appear as true works of art, as great and beautiful monuments of our civilization and our time.

### Cleveland's Building Exposition Postponed

THE postponement of the opening date of the American Building Exposition, Cleveland, from February 22 to a date in April, probably not later than the 18th, is announced by reason of the insistence of Mayor Kohler that the new city auditorium be complete to the last detail before it is formally accepted by the city and offered for exhibition purposes. The exposition is to be the first public attraction in the new building.

This is the second postponement that has been forced upon the exposition management through failure to have the building finished upon schedule time. This uncertainty about the building's completion has worked a considerable hardship, but with the date now fairly definitely fixed the management expects speedily to close out the remaining unsold space, approximately \$15,000 worth of an aggregate of \$100,000.

Both floors of the auditorium will be utilized, and from the variety of exhibits already booked the show promises to be one of the most complete and extensive of the year. On the structural material floor more than 75 per cent of the exhibitors will vie with each other in the artistic quality of their offerings, discarding wholly the stock booths and building special exhibits. The largest of the individual exhibits will represent an outlay of approximately \$25,000.

The exposition, sponsored by The Builders Exchange, is being put on upon a co-operative, non-profit basis, the net profits to be rebated pro rata to the exhibitors, the sole object being to stimulate building interest in the Cleveland district.

### Skilled Labor Scarce in the South

SKILLED labor in Southern fields is extremely scarce. The Aberthaw Construction Company, when doing work below the Mason and Dixon Line, has found it advisable in most instances to import the bulk of skilled labor from the North. Carpenters, masons, and others whose work is high-grade are, in general, much better trained in the North, and can be relied upon to do so much better work that it has been found futile to attempt to rely exclusively on the local product.

When it comes to bosses for the negro laborer, however, these are almost invariably drawn from the local field, because the natives understand how to handle the black man, with special emphasis on the Southern black man, far better than any Northerner can possibly know. They josh him and coax him along in a way which appeals to his sense of

humor, and by keeping up a continual chatter are able to get results which would be utterly impossible by the methods adopted in the North with Italian and other foreign labor. This same form of good-natured raillery often disarms complaints when made, and causes the previously disgruntled dorky to forget his troubles entirely and go off with a grin on his face.

It will be evident from the above random remarks that geography has a good deal to do with the handling of labor in building construction. Knowledge of local characteristics and of various types of men is essential if results are to be obtained. Even under the best of conditions, however, with adequate knowledge and familiarity with the men, there arise many cases where the kind of result desired is unobtainable, no matter how great may be the effort to get it.

### Announcements

Hobart Upjohn, M.E., A.I.A., architect, announces the removal of his offices on January 15, 1922, to Room 5952 Grand Central Terminal, Forty-second Street, New York City.

Mr. Eric Kebbon, formerly associated with Mr. Welles Bosworth, announces that he is now established in the practice of architecture at 522 Fifth Avenue, New York.

Samuel Hannaford & Sons, architects, Cincinnati, announce that they have moved from the Hulbert Block to the tenth floor of the Dixie-Terminal Building.

W. H. Reeves, successor to Reeves & Baillie, architects, announces that Messrs. Ralph R. Burgess and George W. Meyer have become members of the firm, which will continue the general practice of architecture at 125 North Jefferson Avenue, Peoria, Ill., hereafter under the name of Reeves, Burgess & Meyer.

Rodger C. McCarl, architect, begs to announce that he has removed his offices from Wilmington, North Carolina, to 203-204 Latonia Building, Charlotte, North Carolina, for the practice of architecture. Manufacturers' samples and catalogues are requested.

A. Goldberg has removed his office from 354 State Street to 164 Montague Street, Brooklyn, N. Y., and will be glad to receive catalogues, etc.



# Puritan Architecture

By Murray P. Corse

## II

IN a previous article we considered the elements that go to make up this seventeenth-century style of New England architecture, the doors and casement windows, the chimneys and fireplaces. It now remains to gather these up into a whole and to study the effect produced by all working together. Let us begin, then, with the genesis or development of the plan.

How little there was that might be called real development among the details has already been pointed out. With the plan, however, we have more promising material, for this shows some sort of continuous progress. Gaps occur, it is true, and there is a retracing of steps, so that it would never be safe to infer the exact date of a building from its shape or degree of elaboration; this much at least we can say, that an imposing and complex structure like the Witch House, or the Seven Gables in its full development, would not have been found in the first days of the colony.

Moreover, the dating of early houses is so difficult and the examples so few, that a consistent history would be impossible. What appears to be one of the earliest types, the Brown House at Watertown (Illustration I), belongs in all probability to the second half of the century. We may, however, consider it as the prototype; the description and illustrations will enable the reader to visualize it more clearly. We know, besides, from documentary evidence, that the western half of the Whipple House was built considerably earlier than the eastern; that the involved plan of the Seven Gables started with a beginning almost as simple; and that the Paul Revere House in Boston, if we ignore the ell, presents the same disposition on a grander scale.

In the Brown House we have a little jewel of the first water. It might be called, to borrow a phrase from the great French archæologist, the Parthenon of our American architecture. When I first beheld it, it had fallen into the most pitiful state of decay, and a few more winters would have left it nothing but a pile of rotting timbers; but it has since been acquired, most fortunately, by the Society for the Preservation of New England Antiquities and very perfectly restored. Its grace of outline and charm of proportion should go far toward dispelling any illusions we may

entertain in regard to lack of artistic sensibilities on the part of our Puritan ancestors.

As the drawing shows, there are but two rooms and an attic, the latter accessible by ladder. Hence, both rooms had three exposures, in each of which (on the second floor, at least) was a triple casement. For a full discussion of this, the reader is referred to the first article, where it was explained how the frame of the north casement owed its preservation to being walled up by a later addition. Why

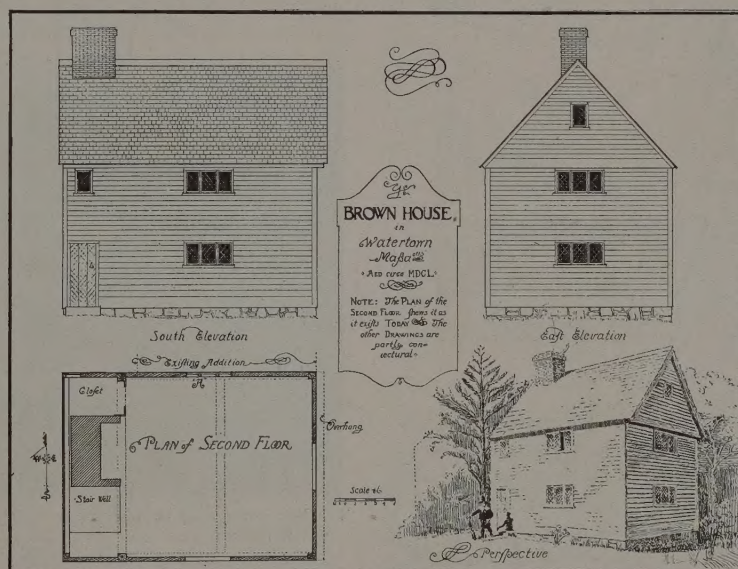
this ell should have been placed in such a position is difficult to imagine, for the intention was almost certainly to enlarge the house along the dotted lines in the perspective, as was actually done in many other cases, as the Whipple House.

This, indeed, seems to have been the regular mode of procedure: to build a "one-room" house, with its long side facing south and chimney at either east or west end, and then to add on at that end, placing the second fireplace back to back. This method might commend itself to the

present generation, which is seldom able, for financial reasons, to carry out its dream-castle at once. Still later, as the family increased, a lean-to was added; but this in general belongs to a later development, and will be considered further on.

The two-room type may be seen to advantage at Topsfield in the Parson Capen House (Illustration II a). The long, straight roof line, unbroken by dormers, is strongly reminiscent of the English countryside, yet the plan is distinctly American. One rarely comes across a rectangular first floor with central entry in front of a huge chimney-stack in the mother country. This central location of entry and stairs, indeed, has clung to our domestic architecture with a tenacity hardly to be paralleled. Later on, to be sure, the chimneys were displaced to make room for a larger entrance and more dignified flight of stairs, and pop out at either end of the ridge, thus producing what we generally accept as the colonial type of home, and its popularity has survived to the present day; but the central entry is its hall-mark.

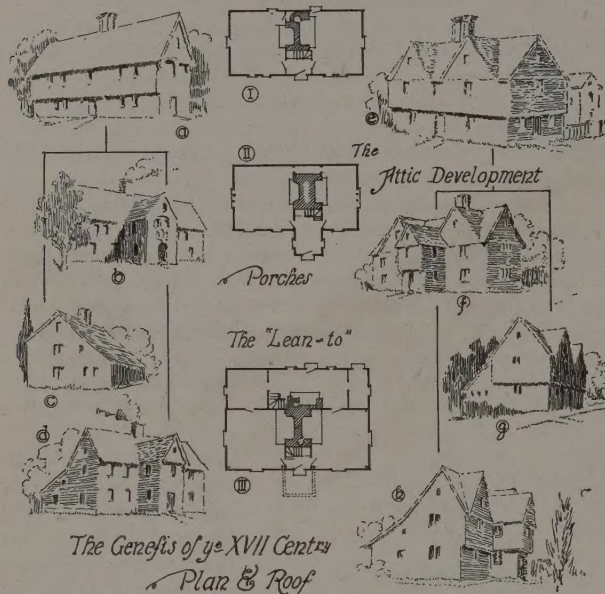
The end-chimney arrangement, however, seems to have been contemporary with the other. Indeed, among exist-



I.



ing examples, if the dates commonly assigned to the so-called Craddock House at Medford (1637) and the Spencer-Pierce House at Newburyport should prove correct, which is doubtful, the end-chimney type would seem the earlier.



II. The plans are merely typical, though taken from actual measurements; the outlines represent: *a*, Parson Capen House at Topsfield; *b*, Spencer-Pierce Garrison, as it now is, Newburyport, showing the development of the projecting porch with an otherwise unbroken roof; *c*, Rebecca Nourse House, Danvers (restored), with lean-to; of *d* there seems to be no extant example, though it must have been common at one time; on the right-hand side is shown the development of gables reaching the main ridge; *e*, Old Hunt House, Salem, now destroyed; *f*, the Seven Gables as it probably looked before the pronounced ell was added; *g*, Ward House, Salem, gables and lean-to, and *h*, the final achievement, with gables, lean-to, porch, and all, such as may be seen in the Ironworks House at Saugus, or as the Witch House may have appeared.

But it will be noted that both of these are masonry buildings. Here motives of economy, which dictated the central location of the chimneys, were not so pressing, and the convenience of large entry and commodious stairs gained the day. Still we see the long unbroken roof line (for the dormers on the Craddock House are modern), identical, except for the placing of the chimney, with the roof of the frame dwelling.

The genesis of the plan, or its family tree, so to speak,



III. Whipple House, Ipswich, with end overhang ("Hewn overhang"), beautifully moulded. Ink line indicates original silhouette.

is shown in Illustration II. At the top the plain rectangle; to the left, with unbroken roof, like the Parson Capen House; to the right, like the Ward House in Salem, with twin gables. The second step is the addition of an enclosed porch, as it was called; projecting entry or vestibule we might call it now. This was more of a gain than seems possible, for it increased the entry appreciably and gave an extra room both on the second floor and in the attic. In the same way the addition of gables gained attic space. These gables were once much commoner, as is evidenced by old prints; during the classical craze of the last century they were ruthlessly stripped off; their exact size and location can, however, be determined by marks of the footing on the plates.

The last addition was the lean-to; at first to buildings already finished, but presently it became an integral part of the plan. While this increased the ground floor, often nearly doubling it, nothing was added to the chambers except closet space. Still later chambers were contrived in the lean-to by raising the roof of the latter. This produced either a broken roof line or a dissymmetrical pitch. An interesting example is shown in Illustration III, the east end of the Whipple House. The ink line indicates the original



IV. Old print of Witch or Roger Williams House, Salem, probably done from memory after alterations.

silhouette. But whether this raised lean-to ever came within the limits of our period cannot be determined from the material at hand.

The full development might have been seen, a century ago, in a house on the corner of Essex and North Streets in Salem, variously known as the Roger Williams or the Witch House. The former title is dubious, the latter sentimental, but as they are well established, there is no use in flying in the face of custom. In its present condition it offers little more than an antiquarian puzzle; fortunately, however, we possess information about its history. To begin with, there is on record an agreement drawn up between Judge Corwin, its one-time owner, and a certain Daniel Andrew, who contracted for alterations. An interesting feature of this document, a portion of which will be quoted further on, is that it gives not only actual dimensions and details of work but the date of the alterations as well. In addition there exist in the Essex Museum several old prints showing the house as it appeared before the classical craze reduced it to a condition satisfactory to the improved taste of the time. One of these is reproduced, the others vary somewhat; but all agree in showing three gables on the front, a projecting porch, diamond panes, and a pronounced overhang to the second story.





V. Witch House as it appears to-day.

Before going on to describe this interesting house more minutely, it will be advisable to consider the overhang at some length. Just when it arrived in this country, what its antecedents were, or its reason for being, are questions much mooted by the authorities. On one point only are they in agreement, namely, that it could not possibly have existed for the sake of fighting the Indians. As their arguments are among the worst that I have ever

encountered, it seems unnecessary to waste any more time on them.

Overhanging second stories had been known in Europe since the early middle ages. They were in all probability copied from military architecture, where parapets carried forward of the wall surface on brackets offer a means of firing on an attacking force. Translated into domestic work, they enlarge the second story, an inestimable advantage in a crowded city. Even in the country, a saving of cellar space is effected. The architectural possibilities are self-evident, and this alone would probably have sufficed to keep the feature in vogue throughout our period.

Structurally, the overhang offers two variations. The first in time as well as in importance is known as the framed overhang, the other as hewn. In the former the first-story posts end at the ceiling level; across these the second-story girts are carried to receive the overhanging girt and the feet of the second-story posts. It will be seen that even when the overhang ran along the front only, a complicated joint ensued; when the overhang was returned along the end, the framing grew quite involved. Of the latter an example may be seen in the garden of the Essex Museum in Salem, under the returning overhang of the Ward House. If you are tall enough to reach, you may let down a panel which the restorers have kindly provided for that purpose, and there study at your leisure this interesting detail of ancient carpentry. With the hewn overhang, on the contrary, the posts are continuous from sill to plate; it is their peculiar shape alone which allows the second story to project over that below. The term is derived from the fact that the posts

are hewn out of a single timber, and it is evident that the overhang could amount to only a few inches at most.

The framed overhang seems to have disappeared about 1690; the other maintained its popularity into the following century, especially in Connecticut, where Messrs. Isham and Brown claim to have seen examples of it as late as the nineteenth. More than a decorative feature it could hardly have been, as the amount of floor space gained scarcely justifies the labor involved. One of the finest examples is on the gable of the Whipple House, with which we are already familiar. Here the huge girt is beautifully chamfered and stopped, and its effectiveness as an architectural feature is particularly striking.

To return now to our restoration of the Roger Williams House, the old prints, I remarked, agree in showing three gables, a projecting porch, etc. Unfortunately, the drawings, it is believed, were made from memory after the building had been altered into its present uninteresting form. We may, however, assume them to be correct in their main features, especially where they are borne out by statements in the aforesaid contract. This is printed in full in the "Visitor's Guide to Salem," published by the Essex Museum. The more important points for our problem are as follows:

The contractor is to build a cellar under the east room (concealed in the photograph (Illustration V) by the drug-store on the right), to underpin the porch and the remaining part of the house "not exceeding three feet in height," and the kitchen on the north side "not exceeding one foot." The size of the kitchen, "twenty feet long by eighteen wide," is mentioned. This kitchen must have been in the lean-to; in another place the document calls for the utilization of stones "in the lean-to cellar that now is." Under lathing and plastering, a reference to the porch and porch chamber, which are to be filled, lathed and plastered with bricks and clay, and lime and hair besides, also to be lathed and "sieved" with lime overhead. The whole is to be finished by August following "provided that said Dael be not lett or hindered by want of carpenter work." Dated nineteenth day of February, 1674-75.

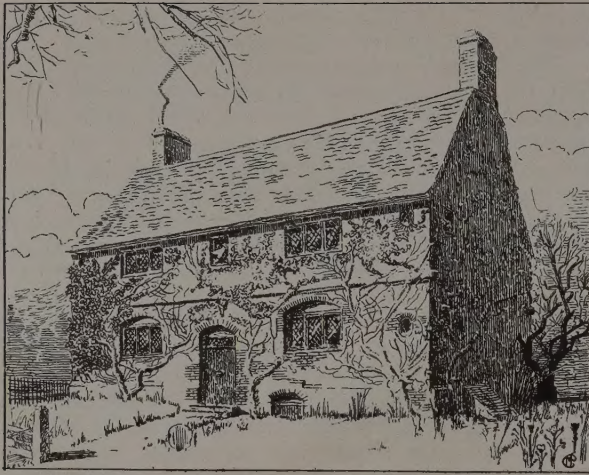
From this it is clear that an east and west room, a good-sized lean-to, and, most interesting of all, a porch large enough to contain a chamber above, were in existence before that date. On considering the photograph, it is evident that the porch projected where the front door is now. The depth of the projection could be determined by an excavation, as it was underpinned. However, we will assume it to be seven feet, as in the Ironworks House at Saugus. The present roof, a gambrel, is evidently a later addition; looking through the branches of the tree, one can see a little ledge breaking around the spur, where the original roof must have intersected. The exact pitch is determined by traces on the chimney in the attic. The depth of the overhang we have; the only thing that remains undecided is the pitch of the gables. As the ridge of the large gables came up to the main ridge, we have only the pitch of the small gable to guess at. This is assumed to be somewhere between the other two.

(Note: the print is too uncertain a guide for any of the details. The end overhang, for instance, could never have existed. Drops and finials are sprinkled around with a prodigality quite out of character with the Puritan spirit. These I have inserted in the drawing (Illustration VI) where they seemed reasonable. Exact data was obtained from a careful survey of the second floor, thanks to the courtesy of Miss Grace Atkinson, who now occupies it with a very charming antique store. Two points may be remarked:



VI. Imaginary restoration of Witch House from actual measurements. (See description in text.)





VIII. Craddock House, Medford, as it may have appeared originally.

in the prints the front gables are shown as covering the whole distance from the re-entrant angle of the porch to the end of the building; this would be an unusual disposition, to say the least; as it is ugly and makes these gables too broad for the main gable and their pitch too flat, I have shown them, as in other examples, stopping about eighteen inches from the end; the side overhang of the porch was omitted, as it made its gable too broad for the others, resulting in either too flat a pitch or too high a ridge. The plan shows the second story, both in its present condition, in black, and the conjectural restoration. Strange to say, the east room has three windows on the front and two summer beams. This caused me considerable vexation, until indications that the house originally ended at the second summer were discovered. This, moreover, makes the right-hand gable, which would otherwise be altogether too broad, about right. A full discussion of doors and windows was given in the first article; it will be unnecessary to retrace the steps here.)

A similar type is to be found at Saugus, in the old Ironworks House, ably restored by the late Henry Dean for Mr. Wallace Nutting. Here were made some of the first iron utensils in this country, and here Mr. Nutting has revived the industry along ancient lines. The house itself is an excellent example of what may be done in this "style," having been carefully restored inside and out, and yet made thoroughly livable and up to date.

These typical plans, however, by no means exhaust the possibilities. The Seven Gables, developing along another line by the addition of a projecting ell, gives us a plan that does not enter into the scheme at all. The Paul Revere House in Boston also has a pronounced ell, in this case making an oblique angle evidently to conform to the shape of an irregular lot. The Spencer-Pierce Garrison at Newburyport, to which a very early date is assigned, had a cruciform plan. In the original disposition there were probably end chimneys as shown in a sketch made for me by Mr. Dean, who was most familiar with the type.

It would have seemed advisable in such narrow limits to confine our attention to frame houses, but I cannot refrain from saying a few words about stone and brick. The Spencer-Pierce, just referred to, is exceptional in every way. I know of no other in Massachusetts so strongly recalling the English-cottage type. Indeed, its resemblance to Crossways Farm, Abinger Hammer, illustrated in "Old Cottages and Farmhouses in Surrey," is so striking as to make one

wonder if the original Pierces did not come from near there.

Of the brick buildings, the Peaslee Garrison at Haverhill, also restored by Mr. Dean, speaks for itself; for the so-called Craddock House in Medford, I have been obliged to make an imaginary restoration (Illustration VIII). There is evidence that the windows were lengthened at the bottom, and the brick pier between the coupled openings is clearly of a later date. This would leave an appropriate space for the triple casements as shown. The dormers also are modern; whether the gambrel roof is original, I cannot say. Other brick and stone houses may be found in Connecticut and Rhode Island, and are well illustrated and described in the books of Isham and Brown.

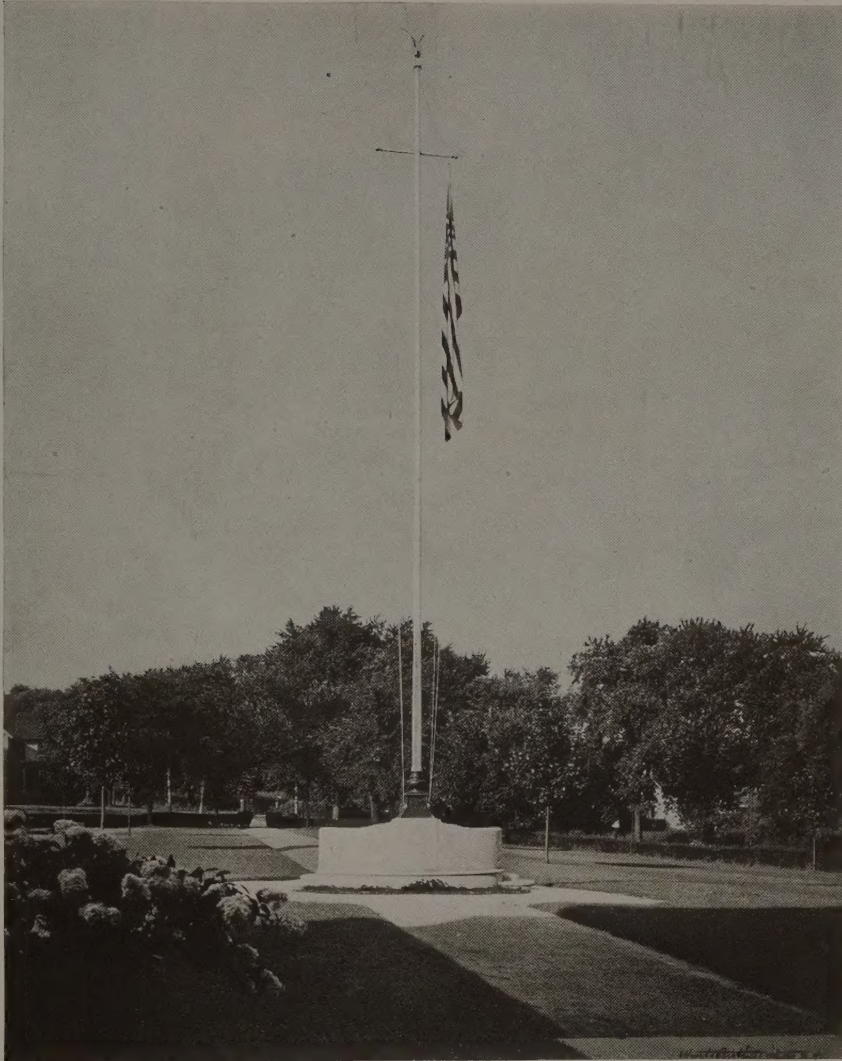
Viollet-le-Duc once made an impassioned appeal for a more careful study of the great monuments of Gothic art, not for the sake of copying them, but that the principles which inspired the builders might be understood, and prove an inspiration for the present day. He based his appeal on several grounds—racial, climatic, economic. His words might be almost without change applied to the situation in this country by substituting this Puritan style for that of the great cathedrals. Racially it is our heritage, devised and perfected by our ancestors; it grew up and adapted itself to the climate in which we live. The half-timber house, for instance, was almost certainly tried and abandoned by the early settlers as unpractical in our violent winters and parching summers, which cause exposed timbers to shrink; nor can the recent revival of half-timber work be called a success, in spite of a few good examples. The old builders had a peculiar gift for adapting the form of their houses to the site; "they seem to spring, like a growth of nature, from the soil on which they are planted," a quality which deserves much closer attention than it often receives; and they had a remarkably true sense of proportion and harmony of shape.

The present day offers an excellent occasion for such a revival, not only on account of the sentimental reason of the tercentenary, but for the far more pressing one of the difficult labor situation and the shortage of materials. Most of our advanced architects are convinced that the day of reckless extravagance in building and sumptuous magnificence in decoration has gone by; and where can we find a better inspiration for dignified simplicity than in these seventeenth-century homes of our Puritan ancestors?



X. Craddock House, present condition.





Albert W. Treat, Robert von Ezzdorf, Architects.

## Soldiers' and Sailors' Memorial, Village of Queens, Long Island, N. Y.

THE Art Commission of New York City has been very generous in its praise of the conception of this monument. It is set very appropriately in the large parking space in front of Public School 34, and interrupts a nine-foot pathway which leads a distance of five hundred feet to the school entrance from the forking formed by two main arteries of highways.

The monument consists of an elliptical platform raised fifteen inches above the ground, approached by three Concord granite steps, the field of the platform being filled with heather-brown quarry tile. The rear half of this platform supports a forty-inch high granite parapet in the centre of which is a die block which forms the base of the fifty-foot steel flagpole, which rises out of the monument at this point and is developed from the granite die block by a statuary bronze socle treated in low relief with the insignia of the army on the two faces and that of the navy on the two ends. Near the top of the flagpole is a halyard arm to designate

the naval character of war service, and the pole terminates with a beautiful gilded American eagle.

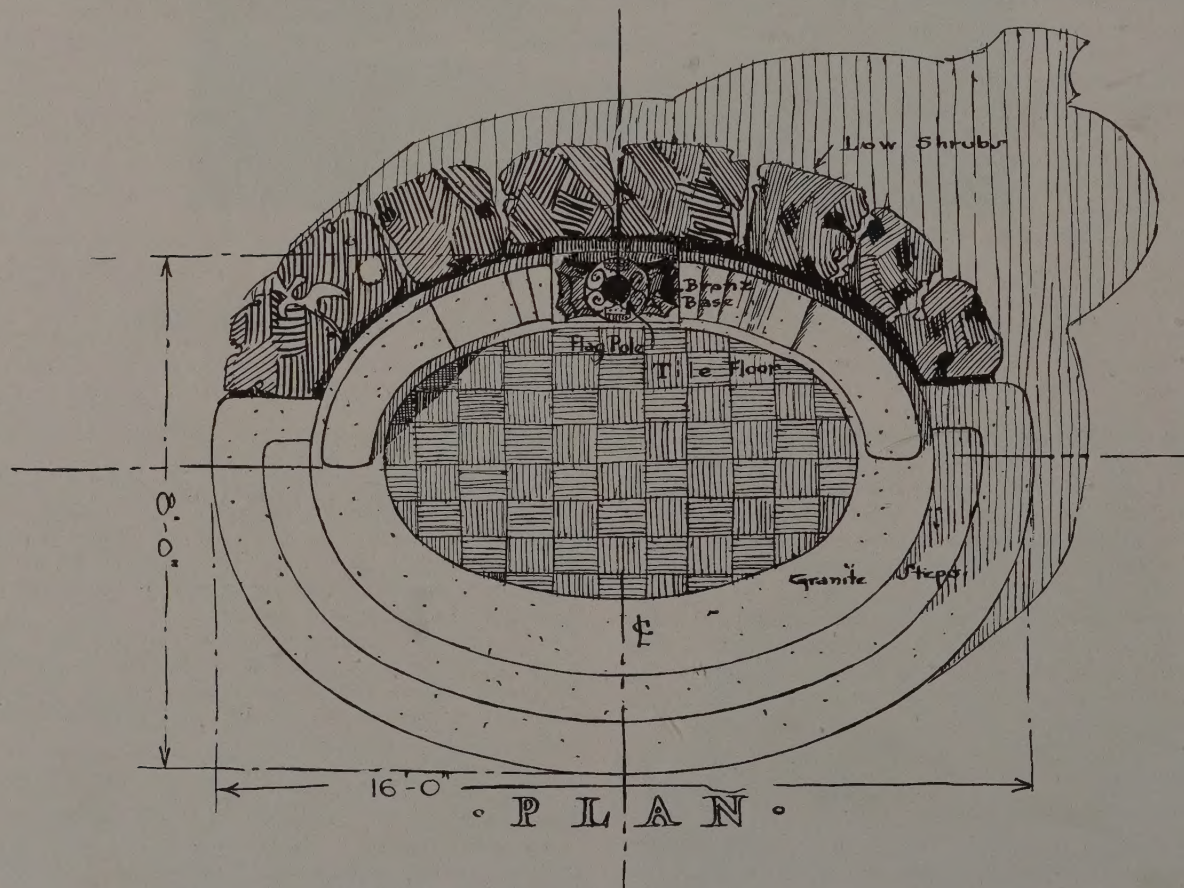
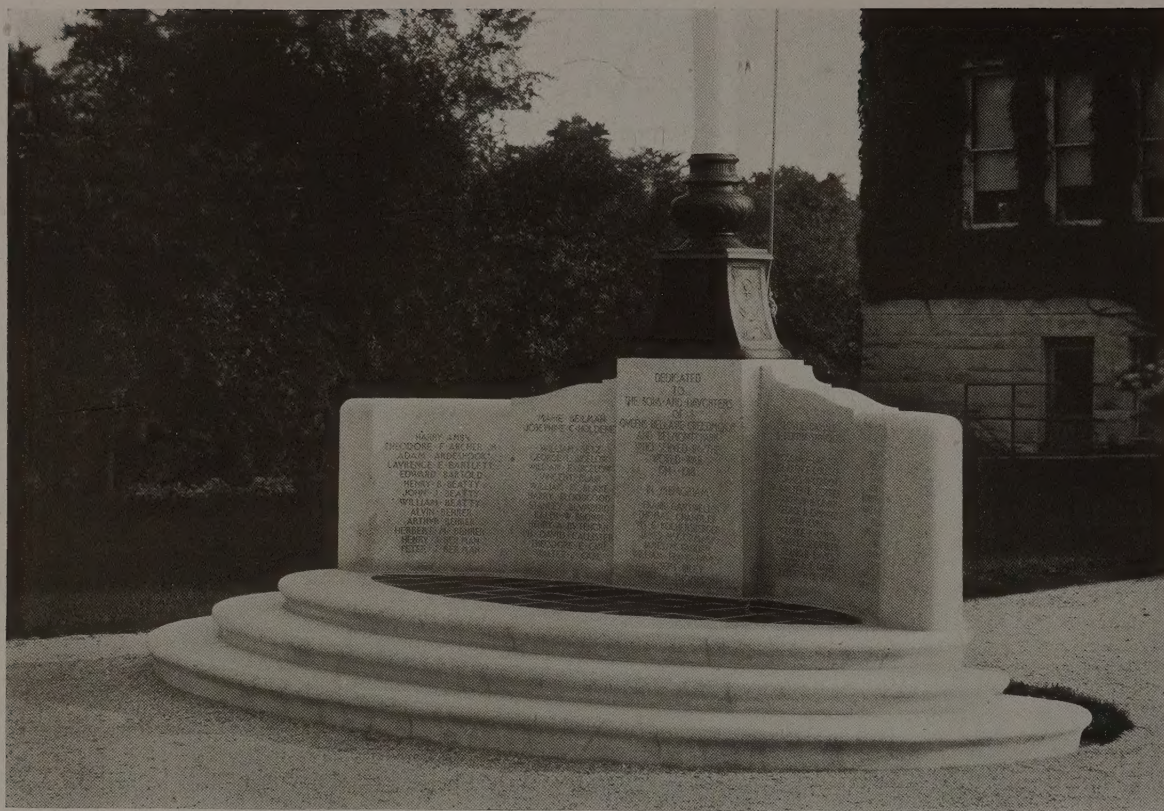
Upon the two faces of the granite parapet are inscribed in incised lettering the one hundred and thirty-eight names of the girls and boys of the locality in the form of an honor roll. The flagpole die block in the centre of the parapet on the front face is used for the dedicatory inscription and the list of "In Memoriam" names.

To complete the ellipse formed by the front steps, there is planted at the rear a border of myrtle and ivy, signifying the immortality of the service rendered by the boys and girls. All the names are arranged in alphabetical order, without regard to rank or station.

The entire operation cost \$5,200.

The platform is planned to be used at each "Safe and Sane" Fourth of July celebration when the villagers gather at the school grounds to watch the children's folk-dancing, and listen to the reading of the Declaration of Independence and the customary Fourth of July orations.





SOLDIERS' AND SAILORS' MEMORIAL, VILLAGE OF QUEENS, LONG ISLAND, N. Y.

Albert W. Treat, Robert von Emdorf, Architects.



## Editorial and Other Comment

### *A Solution of the Building Problem*

THE promise of a great building development in New York City to relieve the housing shortage is said to be dependent upon the willingness of labor to concede, as their part of the work, a dollar a day reduction from current wages. Without this concession the work will be impossible, say the experts, and without the needed construction no part of the community will suffer more from high rents than those whose skilled help will make the new building possible. We have many times said that it is the labor cost that is holding back new construction, and we have cited facts from various authorities. One of the best statements of conditions we have seen is contained in an editorial in the *New York Herald*, and it so clearly summarizes the actual conditions that we take the liberty of passing part of it on to our readers out of town, for the conditions are not local, but govern new construction everywhere.

"What that dollar a day a man means in costs, interest, taxes, and rents is easy to see. In the average dwelling place of New York, whether it is a house by itself or an apartment in a big building, there are anywhere from 1,000 to 3,000 days of labor. This represents an average of from six to ten men on the job for periods ranging all the way from 150 days to 300 days.

"If 2,000 days of labor to the average dwelling represents a fair run of the whole, merely the \$1 for each of the days amounts to \$2,000. Now every dollar of labor, like every dollar of masonry or paint or window glass or whatever the material may be, must work itself into interest charges, must work itself into tax bills, must work itself into insurance and depreciation charges. So every dollar of labor must work itself into the rent which provides the money to meet the interest payments, the tax payments, the insurance payments, and the depreciation payments.

"An interest rate of 6 per cent, a tax rate of  $2\frac{1}{2}$  per cent, and an insurance and depreciation rate of  $3\frac{1}{2}$  per cent all put together make a charge of 12 per cent on every dollar of labor that goes into a house. This 12 per cent on the \$2,000 of labor either added to or taken from the average dwelling place calls for \$240 a year or \$20 a month. If labor sticks it on it is \$20 a month more rent to be paid. If labor takes it off it is \$20 less rent to be paid.

"This has been the reason enough housings were not built and could not be built when the labor cost alone of building an average dwelling place has called for a higher rent charge than the average occupant of the average dwelling place could afford to pay. Readjust the wage costs along with the other costs, which are minor to the labor costs, and the houses will build. It is the only way."

### *Two Fine Achievements*

TWO recent buildings constructed in down-town New York that have added greatly to the architectural dignity of that neighborhood of monumental office-buildings are Mr. Morris's Cunard Building and the new International

Mercantile Building by Mr. Chambers. The latter is an alteration, a making over of the old and ugly red-brick structure known as No. 1 Broadway, and more or less famous as one of our first so-called skyscrapers. In his reconstruction Mr. Chambers has entirely rebuilt the exterior and made a number of important changes in the interior involving some difficult and instructive engineering problems.

The large main booking-office on the ground floor, with its fine light from the windows facing Battery Park, is an admirable example of good taste in its details. The breaking of the long lines of the ceiling by large circles at either end was a happy idea, and the use of various nautical symbols in the decoration, especially the large compasses in the floor, that repeat the greater circles above, give an impression of carefully studied composition. The exterior walls present a harmony in various quiet tones of color with contrasts in detail that add charm without detracting from a sense of well-balanced masses. Both Mr. Chambers and Mr. Morris have shown their fine artistry as well as abundant consideration for those purely practical matters that, after all, must be the things by which all good architectural compositions are judged.

We were pleased to notice that Mr. Chambers has signed his work where all may read that he is the architect, and we wish this were more often done, for we believe it will have a good effect upon the public in making it look upon our architects with both more serious consideration and an inclination to encourage better work in all kinds of building construction.

### *The Architect and Advertising*

MAY an architect advertise like any other business man or is he bound by professional ethics to hide his light under a bushel, or to evade the issue by cutting a little hole in the side and let a small gleam escape now and then when the other fellow is not looking? There are many ways of gaining publicity, from a brass band and a parade to the very proper cultivation of an influential circle of friends socially prominent.

This is only leading up to what seemed to us a legitimate and dignified method of publicity on the part of the well-known firm of Walker & Gillette. Their work was recently on exhibition in a prominent Fifth Avenue art gallery. It struck us as an admirable idea and worthy of being followed by other members of a profession that, after all, is identified with art, no matter how much we may be inclined, in these days of intense seeking after the material things of life, to deny any and all so-called highbrow pretensions.

### *The Exhibition of the Architectural League*

THE annual exhibition of the Architectural League of New York is given this year in the Fine Arts Building, at No. 215 West 57th Street. The exhibition opened on Friday, February 3, and a reception was given on Saturday, February 4.



The exhibition, opened to the public commencing on Friday, the 5th, will last until March 4th, inclusive. Hours are from 10 A. M. to 6 P. M. and from 8 P. M. to 10.30 P. M.; Sundays from 1 P. M. to 6 P. M.

Admission, fifty cents, except on Mondays, which is a free day.

The exhibition this year includes drawings and models of proposed and executed work, both in architecture and the allied arts; also, specimens of decorative painting, furniture, metal work, and ceramics.

Last year, it will be recalled, the League's exhibition was given in the spacious unfinished new galleries of the Metropolitan Museum of Art.

These exhibitions are of value not only to architects and craftsmen but as well to the general public, and we sincerely hope the public will appreciate this opportunity and profit thereby.

Medals were awarded in architecture to Walker & Gillette; in painting to Ezra Winter, for his Cunard Building decorations; in sculpture to Leo Lentilli, whose flagpole for the Rice Playfield dominates the Vanderbilt gallery; in landscape gardening to Olmstead Brothers, for work in Cleveland, Ohio, and Brookline, Mass., and in native industrial art to Samuel Yellin.

The Avery prize was awarded to Grace H. Talbot, for her statuette entitled "The Novice." The prizes in collaborative competition went to Francis J. Creamer, architect; George Davidson, painter; and C. Paul Jennewein, sculptor.

### *The Chicago Architectural Exhibition*

THIS exhibition will be given jointly by the Chicago Architectural Club, the Illinois Society of Architects, the Illinois Chapter, A. I. A., with the co-operation of the Art Institute of Chicago, and is to be held in the Galleries of the Art Institute of Chicago, March 11 to April 9, 1922. The exhibition will be illustrative of architecture and the allied arts, and includes drawings and models of proposed or executed work, academic drawings, examples of rendering sketches, examples of decorative painting, sculpture, and the allied arts and crafts, photographs and other features, especially arranged with the exhibition committee.

### Gold Medal Awarded the Carnegie Institute of Technology

THE gold medal of the Société des Architectes Diplômés par le Gouvernement Français, which was put in the hands of the American Group for award to that institution which shall have most distinguished itself in the year in architectural teaching, according to Beaux Arts principles, has been awarded for the season 1920-1921 to the Carnegie Institute of Technology. Allow me to offer you, for our group, our congratulations of the really excellent results of the serious work shown by your students. As usual the results shown by the competitions held by the Beaux Arts Institute of Design have been used as a basis. The five silver medals for award to individual students who have shown the highest standard therein have been awarded to the following students: R. A. Fisher, "T" Square Club; A. E. Westover, Jr., "T" Square Club; R. F. Lawson, University of Pennsylvania; R. B. Thomas, Yale University; B. Dierks, Carnegie Institute of Technology. Results in work of the first class were shown this year by the following institutions: Carnegie Institute of Technology, Columbia

University, Cornell University, Chicago School of Architecture, Harvard University, John Huntington Polytechnic Institute, Massachusetts Institute of Technology, Pennsylvania State College, Syracuse University, University of Kansas, University of Pennsylvania, University of Texas, University of Virginia, Yale University.

Yours very truly,

(Signed) JOHN M. HOWELLS,  
American Group,  
Société des Architectes Diplômés.

Committee: Messrs. Lloyd Warren, Edwin H. Denby, Jas. Gamble Rogers, Wm. A. Delano, Jos. H. Freeland, John M. Howells.

## Waste in Industry

*From an Address Delivered by J. Parke Channing at the National Convention of the Associated General Contractors, Cleveland, Ohio*

IN assigning the relative responsibility for waste, fifty per cent of this responsibility has been placed at the door of management and less than twenty-five per cent at the door of labor. In assessing this responsibility, there has been no purpose or desire to place blame upon any individual, group, or class. Waste, like industry itself, is the result of a slow growth, but undoubtedly the greatest opportunity to-day for correcting it is in the hands of management. By management is meant all of those engaged in industry, from foremen up to the financial heads of the concern. The importance of management has been shown by that terrible experiment conducted in Russia, in which an attempt was made to carry on industry by the workman himself. It has failed miserably, and now its protagonists are asking that technical men come into Russia to re-establish its industries.

The causes of waste may be generally classified under the heads of Low Production, Interrupted Production, Restricted Production, and Lost Production. Low production is caused by faulty material control, faulty design control, faulty production control, lack of cost control, lack of research, faulty labor control, ineffective workmanship, and faulty sales policies. Interrupted production is caused by idle men, idle material, and idle plants. Restricted production comes about either by restrictions of the owners or management or by labor. Lost production is largely due to ill health, physical defects, and accidents.

The recent Conference on Unemployment makes suggestions toward correcting interrupted production due to idle men. Probably of all things this is the most vital. It is unfortunate that in a country like this United States we should have idle men when we have such rich resources and such demands for finished goods. A large portion of this unemployment is due to booms and depressions, and while we do not thoroughly understand the causes of these cycles, we are getting nearer and nearer to the truth, and I believe that we can look forward to a time when the peaks and valleys will be nearly levelled out.

The one thing, to my mind, that stands in the way is a psychological one, and that is that when we are in a boom period we fail to realize it, imagine conditions are normal, and that the real boom is ahead of us. It is only a few farsighted and sound-thinking men who realize the actual condition. It is incumbent upon owners and managers to study this question thoroughly, to see that information is collected and distributed and to properly interpret it.





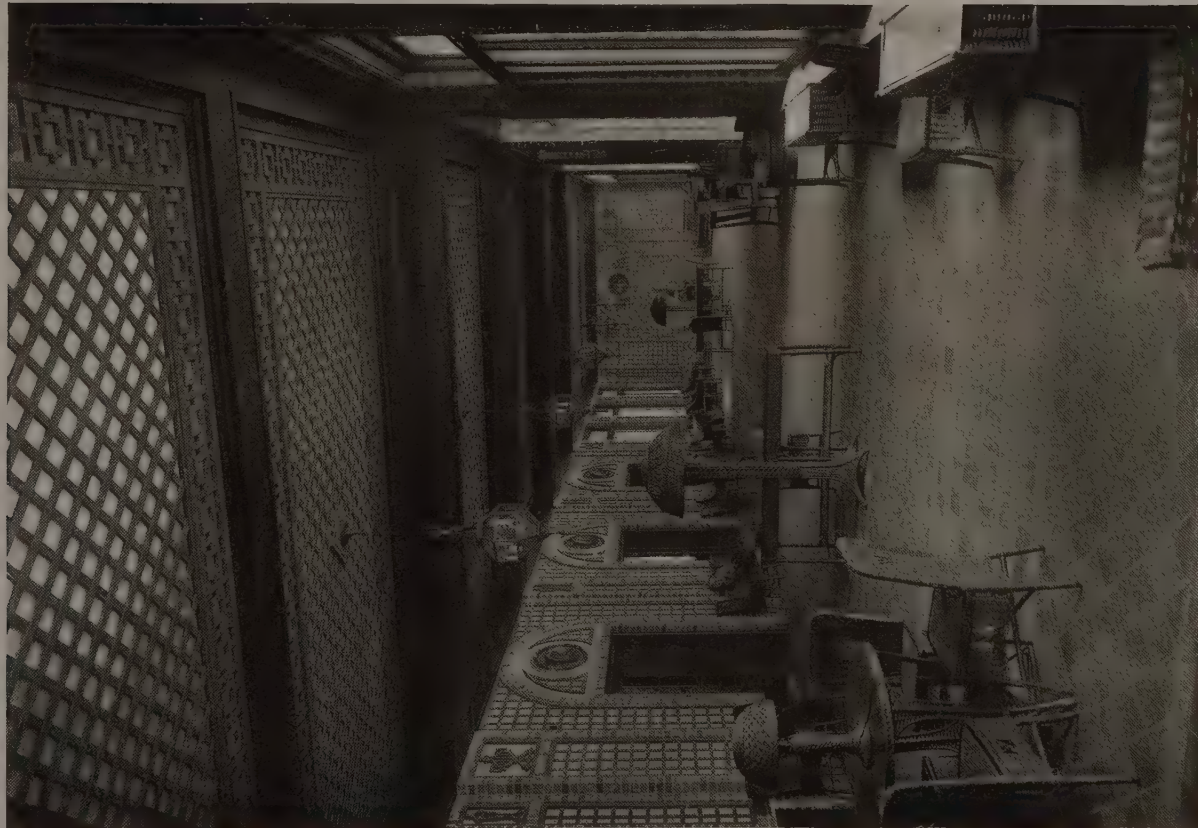
THE HADLEIGH APARTMENT HOTEL, WASHINGTON. D. C.

Appleton P. Clark, Jr., Architect.

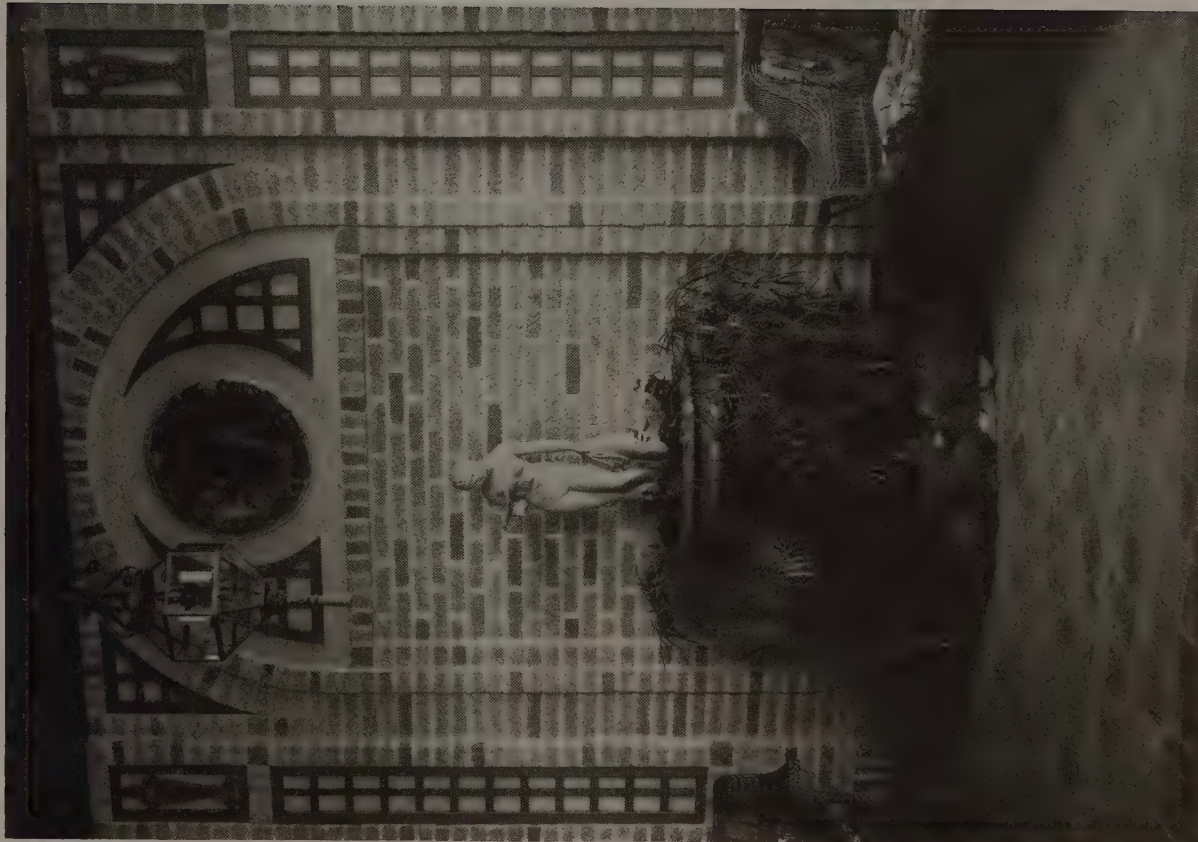








ENTRANCE LOGGIA, FACING 16TH STREET.



FOUNTAIN IN END OF LOGGIA. (Cast aggregate with medallion of colored terra-cotta.)

HADLEIGH APARTMENT HOTEL, WASHINGTON, D. C.

Appleton P. Clark, Jr., Architect.









THE BALLROOM.



THE MAIN LOBBY.

Appleton P. Clark, Jr., Architect.

The walls, columns, mantel, etc., are of cast aggregate. The ceiling is colored after the fashion of Italian majolica.

THE HADLEIGH APARTMENT HOTEL, WASHINGTON, D. C.









THE LARGE PARLOR.



THE SMALL PARLOR. (Panelled in chestnut. Stone and brick fireplace. English glass ceiling lights.)

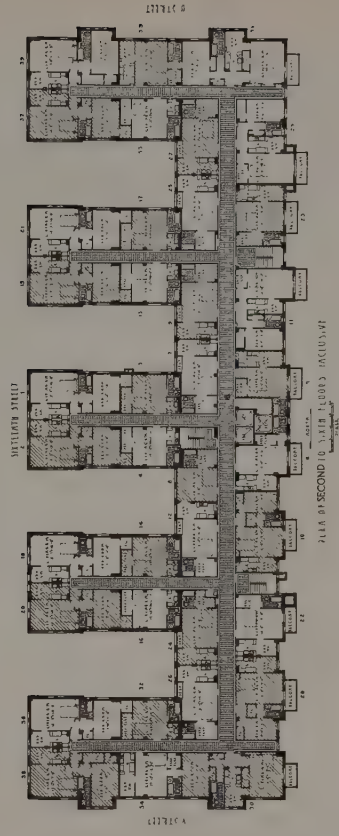
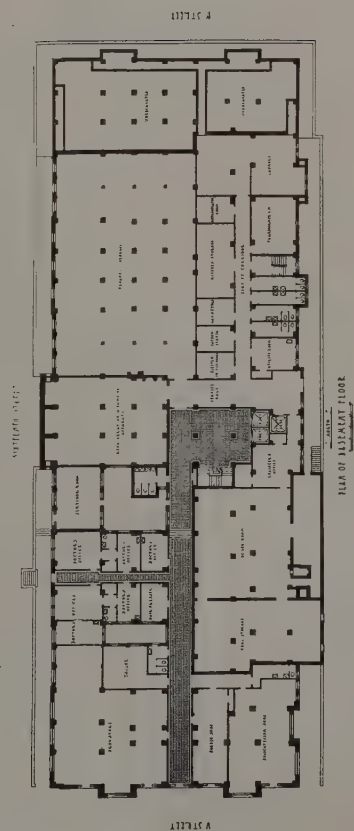
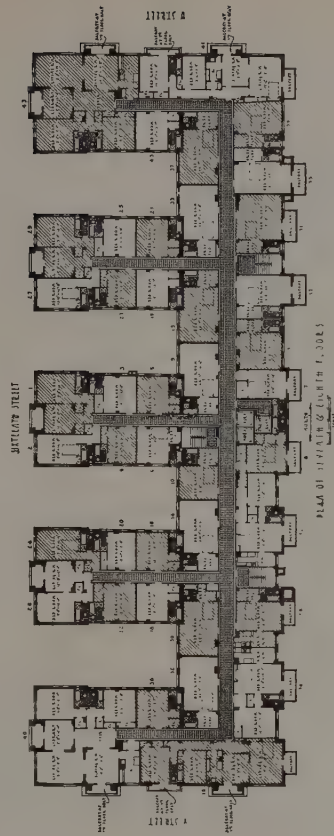
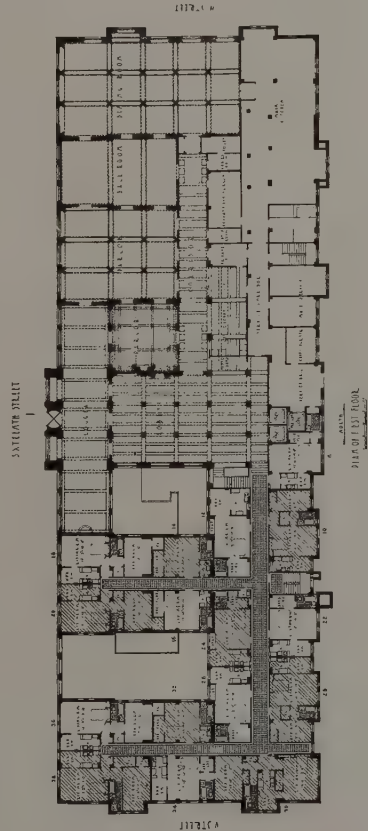
THE HADLEIGH APARTMENT HOTEL, WASHINGTON, D. C.

Appleton P. Clark, Jr., Architect.









PLANS, HADLEIGH APARTMENT HOTEL, WASHINGTON, D. C.

Appleton P. Clark, Jr., Architect.









ADMINISTRATION BUILDING, R. WALLACE & SONS MFG. CO., WALLINGFORD, CONN.

Walter P. Crabtree, Architect.









DETAIL OF MAIN ENTRANCE.

ADMINISTRATION BUILDING, R. WALLACE & SONS MFG. CO., WALLINGFORD, CONN.



STAIR HALL, FIRST FLOOR.

Walter P. Crabtree, Architect.







BILLING AND ENTRY DEPARTMENT, SECOND FLOOR.



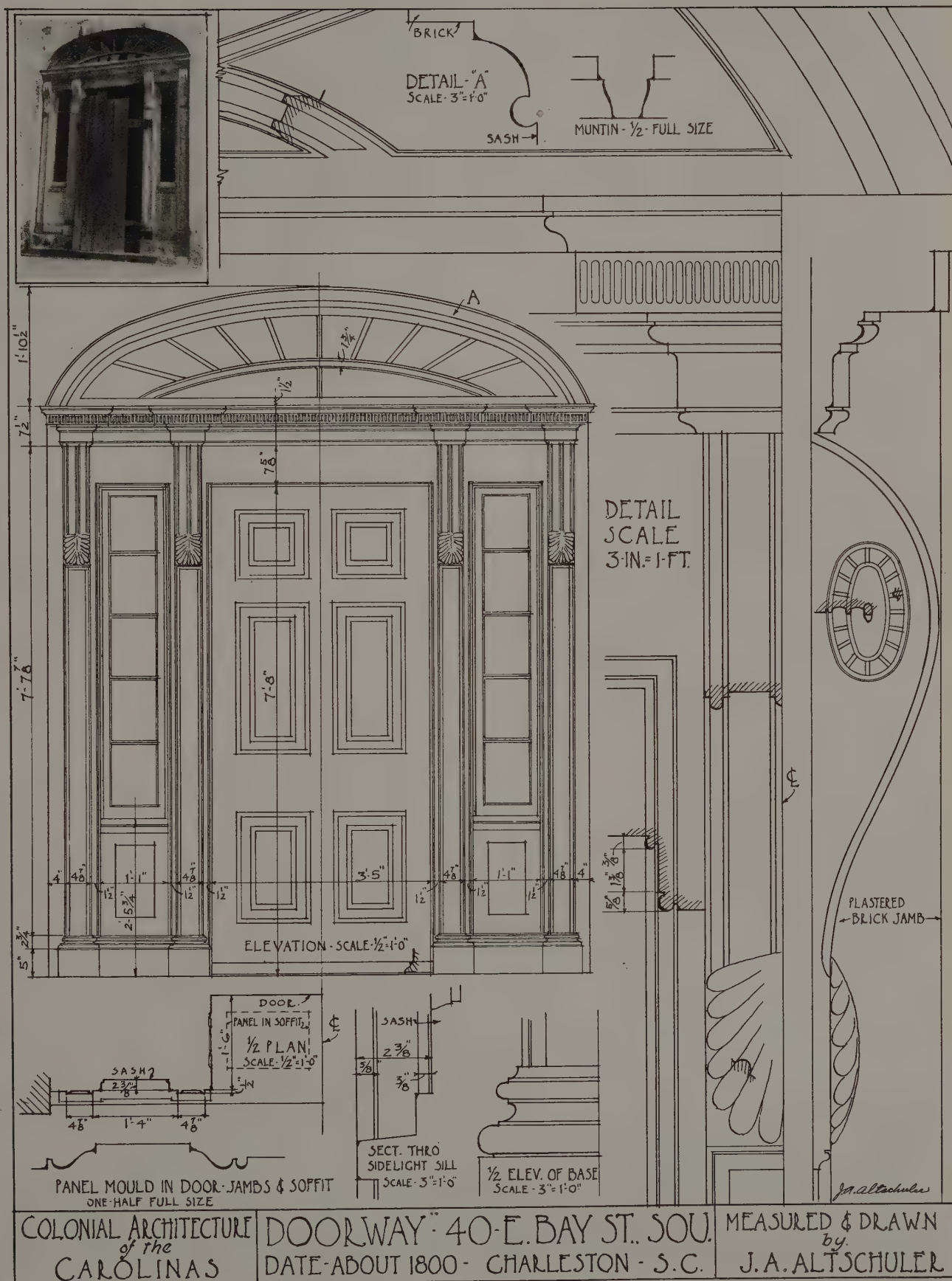
STAIR HALL, SECOND FLOOR.

Walter P. Crabtree, Architect.

ADMINISTRATION BUILDING, R. WALLACE & SONS MFG. CO., WALLINGFORD, CONN.











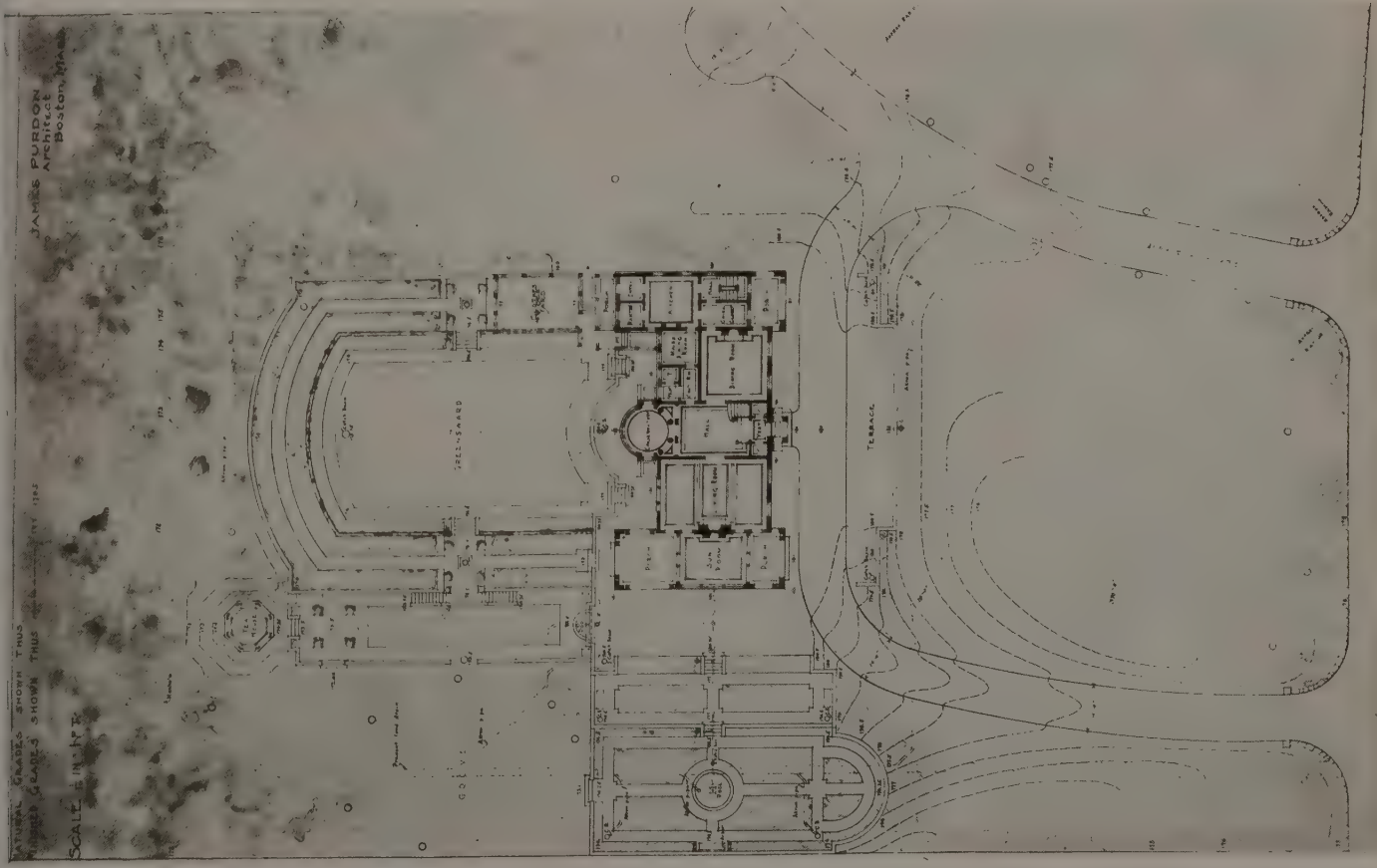


FRONT, SUBURBAN RESIDENCE IN MASSACHUSETTS.

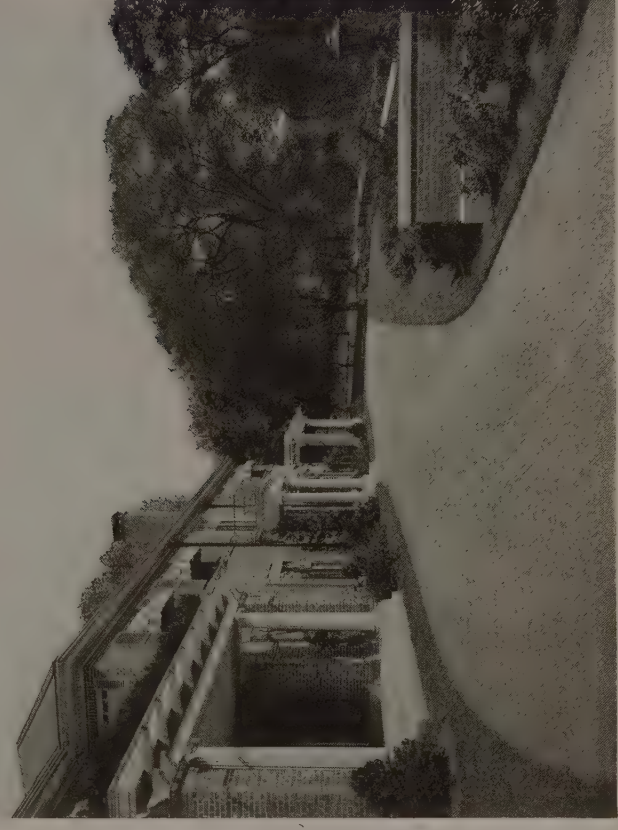
James Purdon, Architect.







CONSERVATORY.



FRONT TERRACE.

JAMES PURDON, Architect.

SUBURBAN RESIDENCE IN MASSACHUSETTS.







SUN-PARLOR.



LIVING-ROOM.

SUBURBAN RESIDENCE IN MASSACHUSETTS.

James Purdon, Architect.







HALL.



DINING-ROOM.

SUBURBAN RESIDENCE IN MASSACHUSETTS.

James Purdon, Architect.







MAIN BOOKING OFFICE (FIRST CLASS), INTERNATIONAL MERCANTILE MARINE BUILDING, No. 1 BROADWAY, NEW YORK.

Walter B. Chambers, Architect.

feet in diameter, correctly oriented and composed of red Numidian, Belgium black, green and white cippolino, verde antico, levanto, breche-violette, and American white marbles.

Against the soft buff-colored Botticino marble walls are twelve panels, destined to frame a historic series of portraits of the company's best-known ships, from the days of the old sail and side-wheel vessels down to the latest super-giant *Majestic*, now nearly completed.





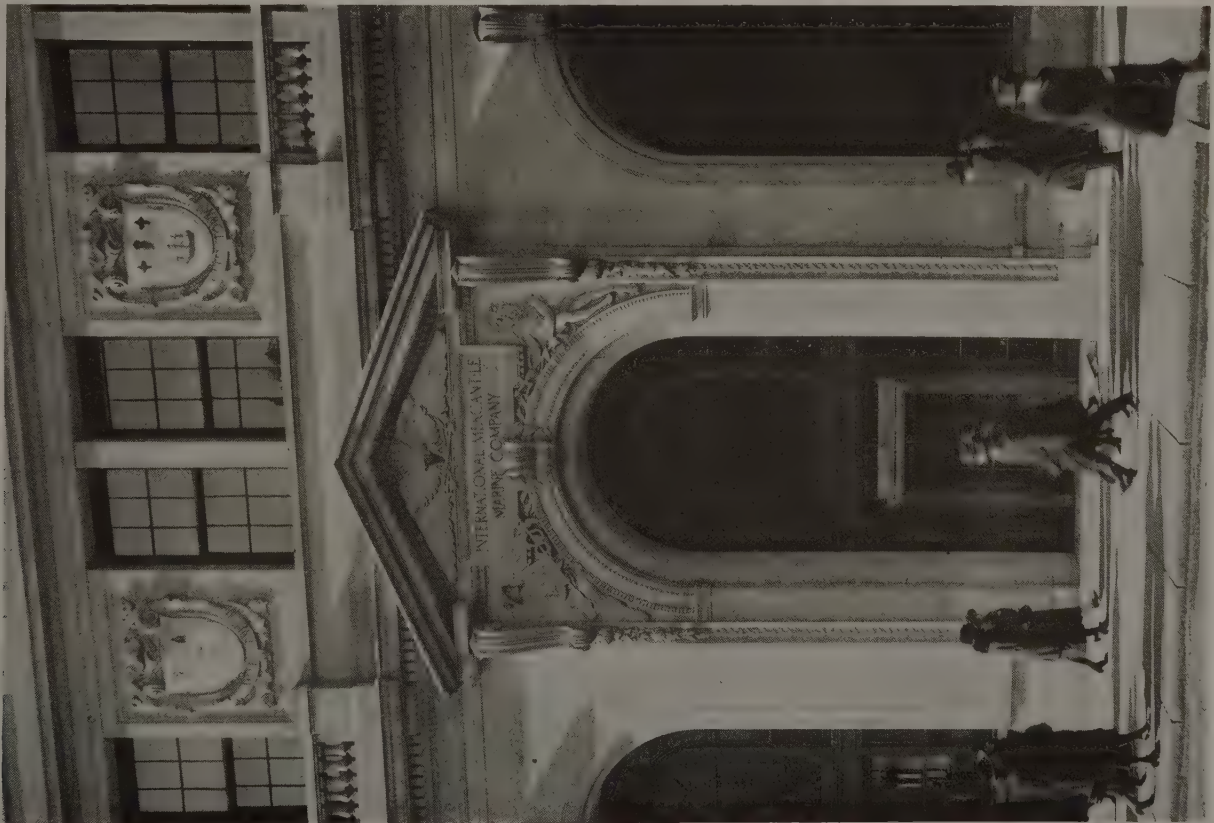


GALLERY, MAIN BOOKING OFFICE, INTERNATIONAL MERCANTILE MARINE BUILDING, No. 1 BROADWAY, NEW YORK.

Walter B. Chambers, Architect.







MAIN ENTRANCE,

INTERNATIONAL MERCANTILE MARINE BUILDING, No. 1 BROADWAY, NEW YORK.



PASSAGE FROM WAITING-ROOM TO BOOKING-OFFICE.

Walter B. Chambers, Architect.

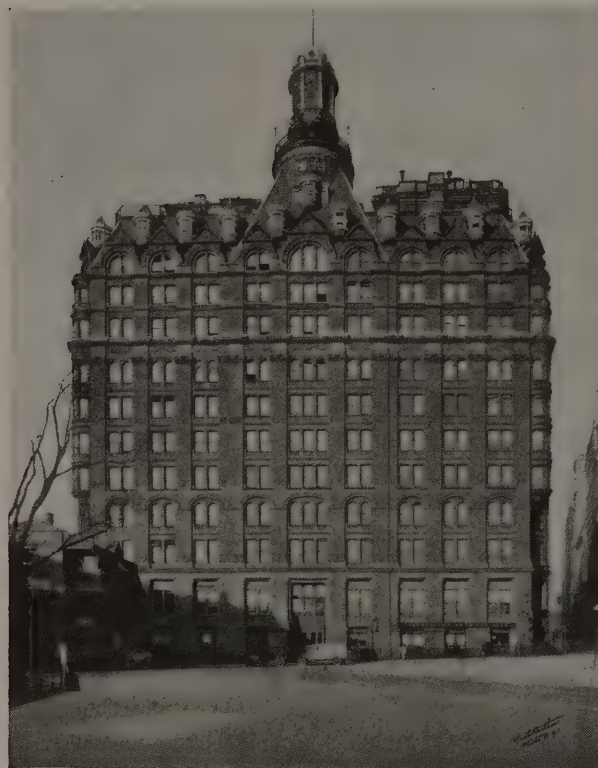
# Reconstruction of No. 1 Broadway

Walter B. Chambers, F. A. I. A., Architect



THE problem was to transform an old-fashioned red-brick and brown-stone structure, inadequately planned and equipped, as measured by modern needs, into an up-to-date office-building, specially arranged to meet the requirements of its new owners, the International Mercantile Marine Co.

To make the radical structural changes needed in order to rearrange the interior spaces, to recast the exterior into a dignified and agreeable architectural composition, expressive of the building's character and purpose, and to do this while nearly two-thirds of the building was occupied, and without unduly disturbing or inconveniencing the occupants, added special difficulties.



No. 1 Broadway (before alteration), Battery Park façade.

The old elevator equipment had to be discarded because it was mechanically unfit and the elevators were in the wrong places. Eight new electric elevators were installed, in two banks. In order to maintain service for the occupied

floors it was necessary to install and operate one of the new banks of elevators before the old ones were taken out.

The same thing is true of the old staircases. The two new stair lines had to be built in their new locations before the old ones could be removed.

The old plumbing and heating systems were completely discarded and replaced by modern equipment, which includes a proper fresh-air supply and vitiated-air-exhaust ventilating system for the company's main offices. But the service to the occupied floors was maintained without interruption.

A new electric-wiring system was installed and a pneumatic-tube equipment added.

To carry out this work while seven floors of the building were occupied complicated matters immensely and caused many delays. A programme was prepared in the architect's office, in which the exact sequence of the operations was carefully studied, to insure their practical working, and this programme was carried out to the end, with only minor modifications, and always directly under the architect's supervision.

There was no general contractor in charge of the work. The work under each trade—more than forty of them—was done under a direct lump-sum contract, awarded by the owners after competition to the lowest bidder on the architect's detailed drawings and specifications prepared for that particular trade.

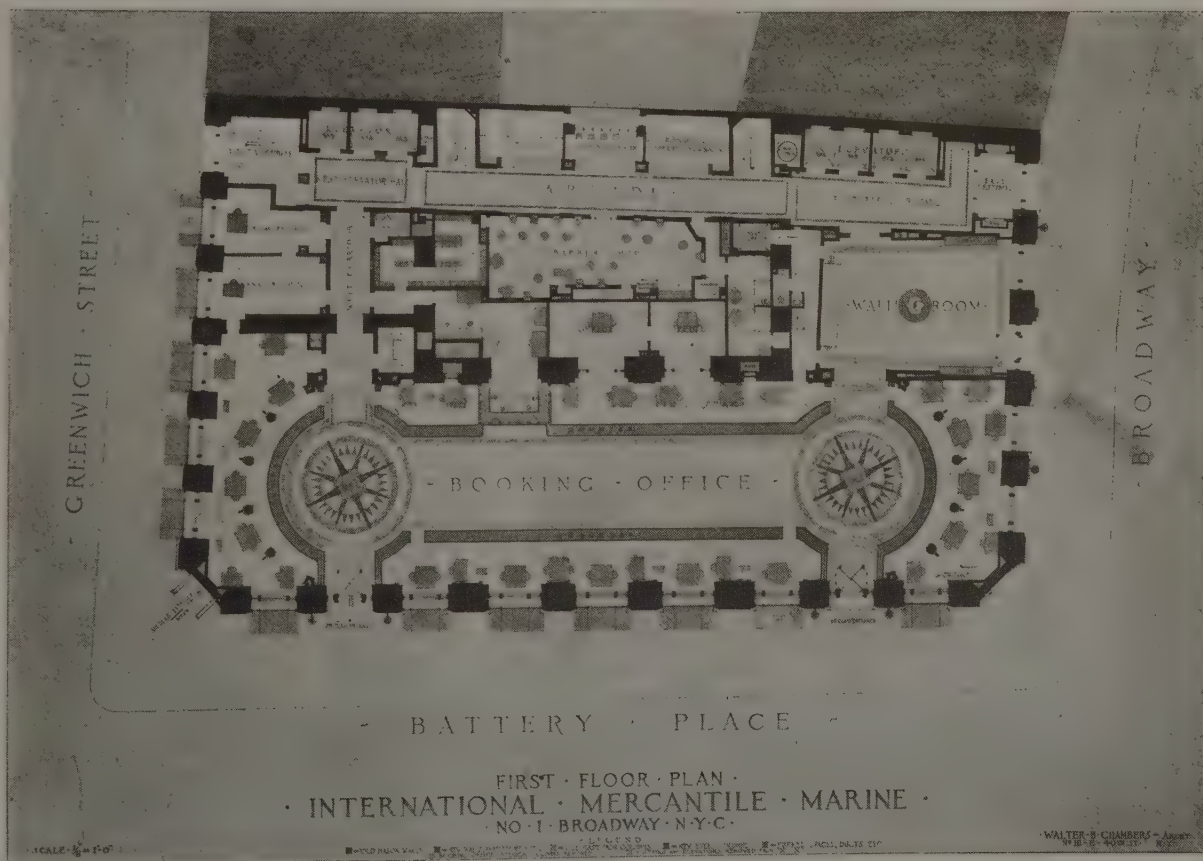
This is true of all but two of the forty-odd trades involved—the only two exceptions being the structural steel and the masonry cutting, etc. The nature of the problem made it impossible to have these two trades under lump-sum contracts.

The remodelling of the upper part of the building—removing the old roof, adding new stories—required the



Architect's sketch for alteration.







DIRECTORS' ROOM.



BETWEEN DECKS, SECOND-CLASS BOOKING-OFFICE.

Walter B. Chambers, Architect.

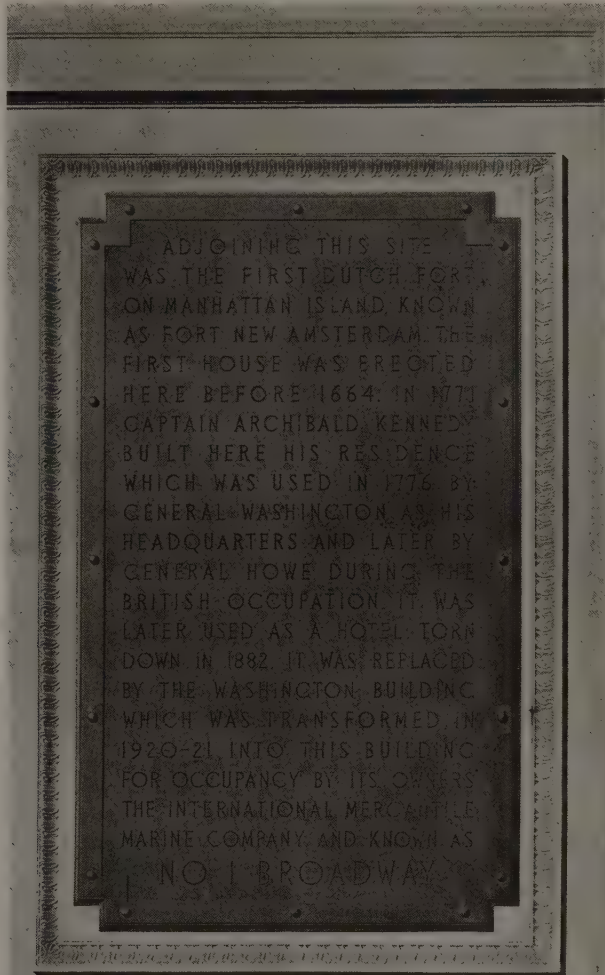
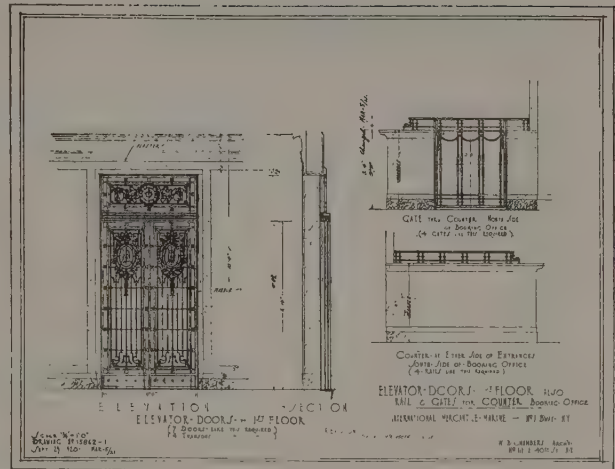
INTERNATIONAL MERCANTILE MARINE BUILDING, No. 1 BROADWAY, NEW YORK.



installation of a temporary roof, at the ninth-floor level, to protect the occupants of the floors below while that work was going on over their heads.

In order to provide the owners with an adequate booking-office, it was necessary to take out an entire tier of floor-beams and their supporting columns and throw the ground and first floors into one. To do this the first step was to put in place heavy steel girders at the second-floor level, each girder over forty feet long, five feet high, and four feet wide, and weighing over thirty tons.

These spanned the whole building from front to rear



the company's principal ports of entry have been placed in Venetian mosaic against the piers at the second-floor level on the Broadway and Battery Park façades.

The stone carvings surrounding them, and those around the main entrance on Broadway, are composed of nautical and marine elements, anchors, ropes and pulleys, tridents, sea-shells, and starfish.

In the spandrels over the main entrance are the figures of Neptune, God of the Seas, and Mercury, God of Trade, and above them is the American emblem, the eagle.

Flagpoles in bronze sockets, guyed back to the stone fronts and grouped four on the Battery Park façade and two on Broadway, are for the flags of the company's various steamship-lines.

The details of the interior ornamental work have been designed and carried out in the same spirit.

The bronze counter gates and railings in the booking-office and the wrought-iron grillework on the elevator fronts in the main hall also include in their design the anchor, rope and pulley, steering-wheel, trident, sea-shell, starfish, and dolphin motives, sometimes combined with the company's monogram.

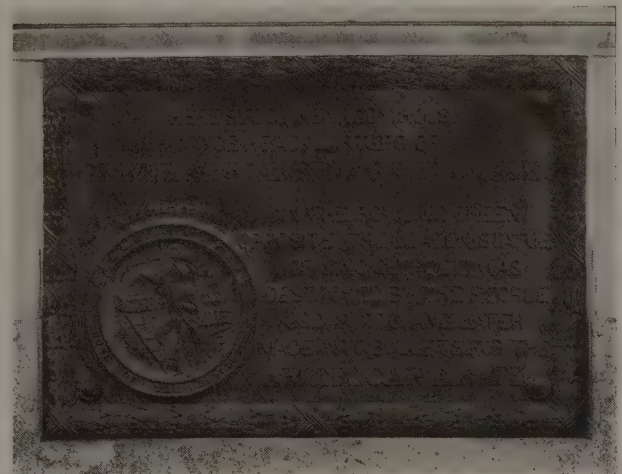
The waiting-room, on Broadway, will also have the five large panels on its walls filled with paintings of marine or nautical subjects allied to the company's activities.

*Note.*—The New York Down-Town League recently awarded Mr. Chambers the first prize for this alteration of a representative down-town office-building.—EDITOR.

wall, and were designed to carry the weight of the entire framing above. The second step was to let this weight down upon the backs of the new girders. These were two very delicate engineering operations, which required the most careful study for their successful achievement. After they were done it was a comparatively simple matter to remove the old beams and columns below the new girders, leaving the big space clear and ready to be transformed into the company's booking-office, which is over one hundred and sixty feet long, forty feet wide, and twenty-five feet high.

In designing the building, the architect's purpose was to express in both the exterior and interior character its ownership and occupancy by the International Mercantile Marine Company, whose ships sail to all parts of the globe.

Heraldic devices of the twenty cities which are among







# A Little House of Spanish Style

By Charles Alma Byers

THE Spanish style of architecture has naturally exerted a very pronounced influence in home-building in southern California since the earliest days, but not always have the interpretations of the style been good or expressive of a proper comprehension of its true possibilities. In the last few years, however, a quite commendable advance in this direction, particularly in that the architects are endowing their interpretations with more feeling and with more of the style's native atmosphere, is becoming manifest.

The little house illustrated herewith (pages 58 and 59) is charmingly exemplary of this improvement. It is naturally an adaptation with modifications, to suit it to modern American requirements; yet it retains, outwardly at least, not only all the most desirable of those characteristics that typify domestic Spanish architecture, but also much of the style's charm in the way of atmosphere. But a single story in height, it possesses the generally desired low and rambling appearance, and it is, moreover, designed with the usual court, or *patio*, as well as with a most charming pergola reaching out into the garden in the rear.

As seen from the street, the house has a pleasingly dignified appearance, and yet it is by no means characterlessly plain. The front entrance, which is especially attractive, is designed with a rather massive employment of blue-red brick for the steps and unevenly floored stoop, and with *bas-relief* ornamented but simply lined framing for the doorway of cast artificial stone of a light-gray shade with marble-like veining. Immediately above the arched hood of the entrance's framing is a wall embellishment in the nature of a small circular window, uniquely recessed, and this part of the wall, somewhat elevated and arched, is finished with a brick coping. The door itself is of dark-brown oak, and over it, enclosed by the slightly extended hood, is the usual electric light.

The exterior walls are of cement-stucco over frame construction, and are finished in a deep shade of tan. The roof, for the most part, is flat and of composition, and hence is concealed by the higher extending walls. The middle portion, however, consists of dark-red roofing tile, with front and rear slopes. Similar tile is also used for covering a small cornice-like roof extension over a group of French windows on the front. The color scheme, which is particularly enhancing, further includes dull olive-green for the trimming, which is confined mainly to the woodwork about the windows; and black wrought-iron grilles, contributing still an additional color, comprise character-lending enclosures for the French-window group on the front and for each of the single windows of the same type at either side of the chimney on the left-hand wall.

The *patio* in the rear, with its attending features, not only is an exceptionally large one but constitutes a retreat that is very much to be appreciated, indeed. Closed in on three sides by the walls of the house and on the remaining side by a high stucco-finished garden-wall, it naturally affords the utmost privacy. In the centre is a small brick-edged pool, surrounded by a well-kept lawn, and about the four sides of the space runs a cement-paved walk, bordered by an effective planting of low-growing shrubbery. Facing

the court from the front there is a long veranda, or porch, nine feet deep, which is floored with dark-red cement, possesses a gas-grate fireplace, and is excellently furnished. Two large arched plate-glass windows and two pairs of French doors, set in doorways of the same size and similarly arched, interpose between this veranda and the *patio*; and the porch is directly accessible through glass doors from the living-room, the dining-room, and two of the bedrooms, while the *patio* itself may be directly reached not only by way of the porch but from the kitchen, the rear bedroom, and a bathroom.

Extending away into grounds in the rear from the gateway in the back wall of the *patio* is the pergola. It is erected over a cement-paved walk, and both its uprights and its crosspieces are of eucalyptus—logs and poles in the rough. Vines, incidentally, are being trained to climb the uprights, and in time the walk will be a veritable corridor of green.

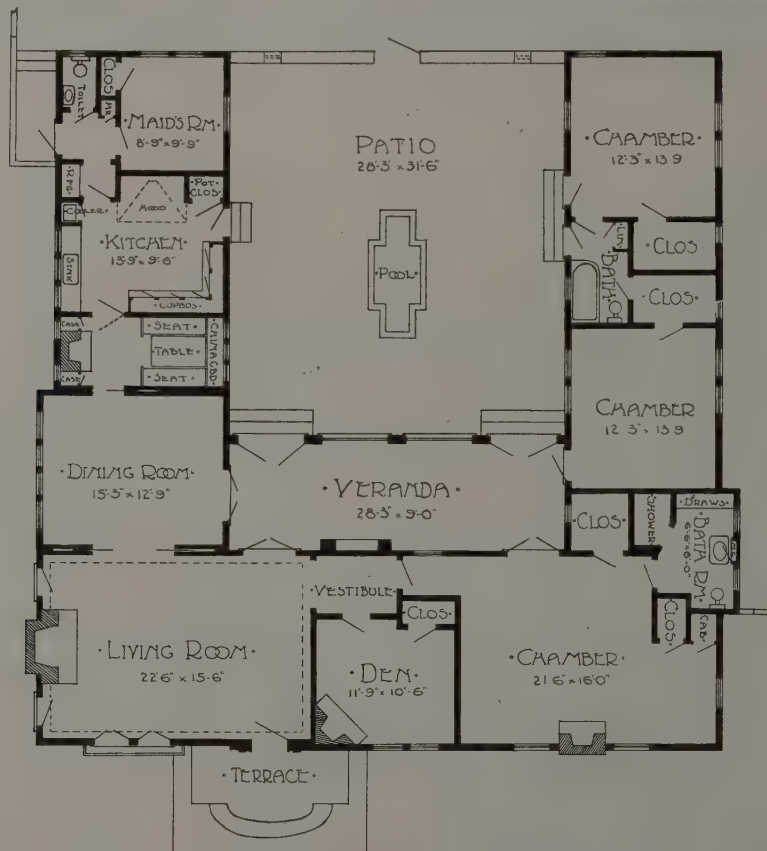
The arrangement of the house's interior will be observed from the floor plan. It should be especially noted that, in addition to the customary living-room, dining-room, kitchen, and bedrooms, there are two baths, a den, a maid's room, and a most delightful little breakfast-room. The last-named division is equipped with built-in seats and table, as well as with china cupboards and drawer-and-shelf cabinets, and contains a gas-grate fireplace. Similar fireplaces are also found in the den and a bedroom, and in the living-room there is a large wood-burning fireplace. There is an unusual liberal introduction of conveniently located closets, and there are also many excellent built-in features, especially in the kitchen, little breakfast-room, and the bathrooms.

The interior is not only delightfully arranged but also charmingly finished and decorated. The woodwork consists of Southern gum, finished in mahogany style, in the living-room and dining-room; of California redwood, waxed but nearly natural as to color, in the den; of pine, in old ivory finish, in bedrooms, maid's room, and veranda; and of pine, in white enamel, in the bathrooms, kitchen, and breakfast-room. The living-room and dining-room are finished with staff cornices, and the walls of the den are treated with a panelled wainscot and plate-rail, to a height of five feet. In the living-room and dining-room the walls are covered with light-weight canvas and painted a light-tan shade; in the bedrooms and maid's room they are papered; and in the kitchen they are finished, in high wainscot effect, with a smooth, hard plaster coat which is enamelled like the woodwork. Oak flooring is used throughout, except in the bathrooms, even to the kitchen and the closets, and the bathrooms are floored with tile and finished with tile-wainscoted walls.

The house possesses neither basement nor cellar. It is heated by the gas-grate and wood fireplaces already mentioned, and is otherwise modernly and completely equipped in every respect. It is located in Long Beach, California, and is the home of G. Van Camp. H. H. Whiteley is the architect.



A PERGOLA OF EUCALYPTUS LOGS AND POLES EXTENDS FROM THE PATIO INTO THE REAR GROUNDS.



PLAN.

H. H. Whiteley, Architect.

HOUSE, G. VAN CAMP, LONG BEACH, CALIF.





STREET FAÇADE.



VERANDA FACING PATIO.

HOUSE, G. VAN CAMP, LONG BEACH, CALIF.

H. H. Whiteley, Architect.

# Jean François de Neufforge and Some Reflections on Domestic Architecture in America

By Henry Coleman May

IT is natural to suppose that art is in a constant state of evolution. Yet there appears, at given moments, to have been times in its history when, through the accomplishment of an individual, the very last word would seem to have been said. There have been artists whose genius was so great that their productions must represent the highest possible development of their particular branch of art, whether that be painting, sculpture, or architecture. On looking at such works one feels that the future may produce things as good, but that to do better would be well-nigh impossible.

This view presupposes that the arts are susceptible of culmination; that their development has necessarily a limit. It would be nearer the truth, however, to say that the youth of art is eternal, that no climax can be reached. Its tentative stages are over, its full development has long since been arrived at; its manifestations renew themselves so regularly that ultimate stagnation would appear to be wholly impossible. It has now become a question of interpretation, no longer one of development. The greatest works belong to all time. Velasquez and Sargent might have met as contemporaries. Michael Angelo is eternal; he would have found himself quite at home in Rodin's studio, and not disapproving. . . . Palladio and Samson, with all their differences of taste and temperament, might easily have been friends.

The history of domestic architecture in France found its apotheosis in the middle period and toward the end of the eighteenth century. Its highest manifestations are seen in the works and those resulting from the guidance of Antoine, Soufflot, and Gabriel. Their buildings are not only objects of beauty but examples of perfect practicability in designing and planning. From the point of view of pure architecture the houses of the Louis-Quinze and Louis-Seize epochs were triumphs. They represented a combination of the best motifs of the "grand siècle" with the new requirements resulting from a more intimate comprehension of every-day life. The spirit was classic but the interpretation thoroughly French, just as, centuries before, the Greek forms translated to ancient Italy became distinctly those of imperial Rome.

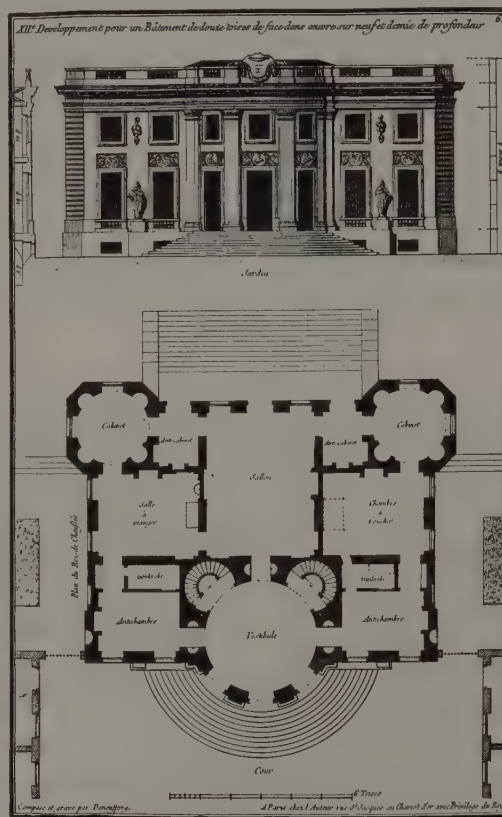
From about 1700 down to the outbreak of the Revolution French architecture was an expression in stone of the mentality of every cultured artist and thinker of the day.

It was a result of that critical quality which is developed among the French to such a pre-eminent degree. In all their works, and principally in those inspired by the academic, there was that fidelity to sequence, interpreted with the elegance, distinction, and logic so peculiar to Gallic architecture since the development of the Renaissance.

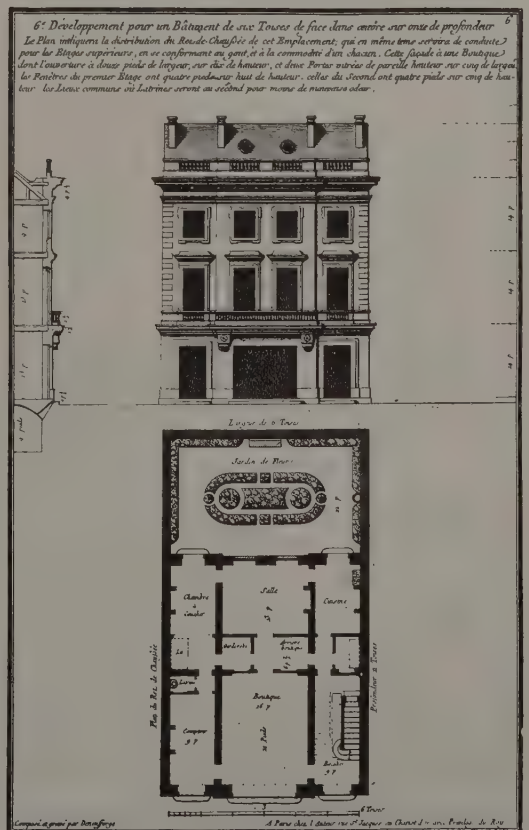
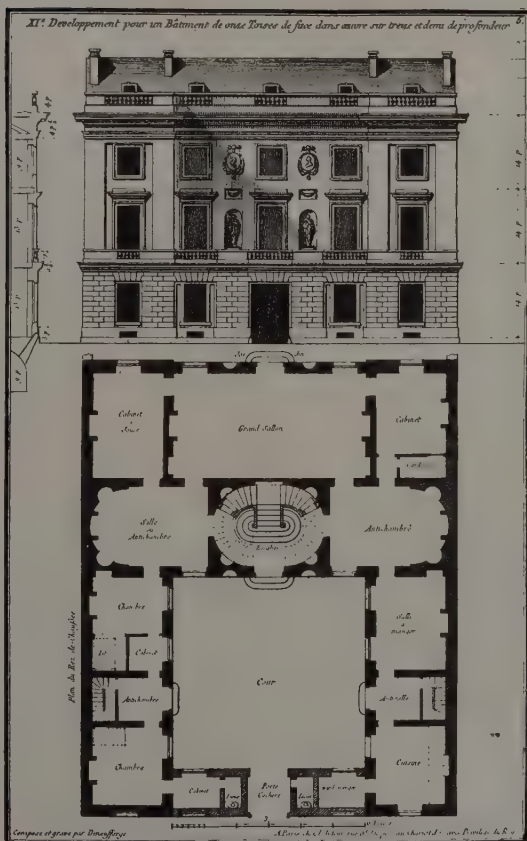
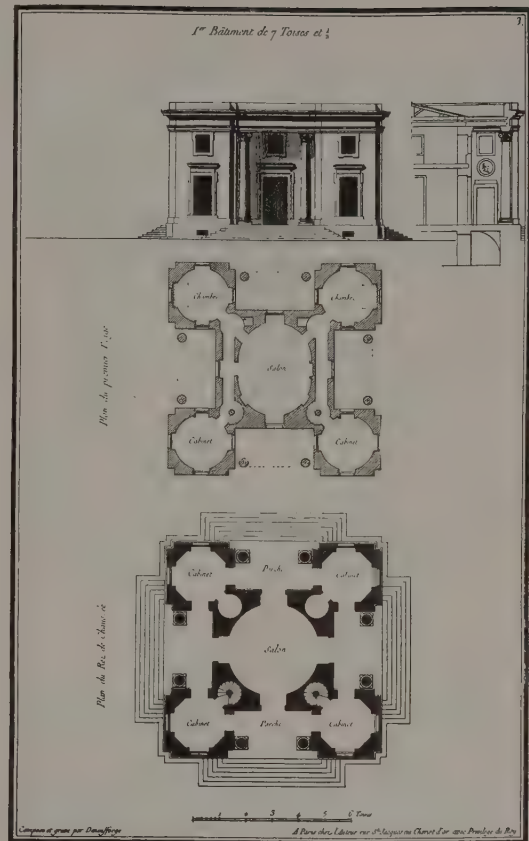
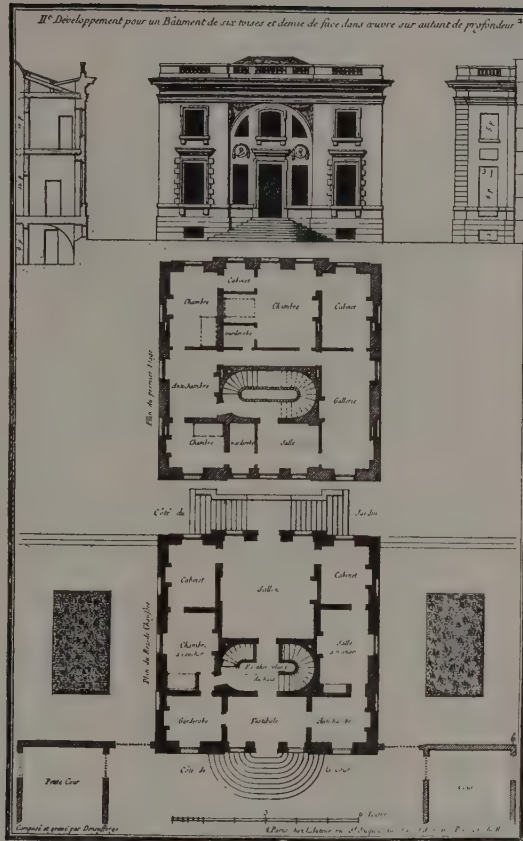
There will, of course, always be people who prefer, for instance, the superficial and very often meaningless ornament of the old palace at Blois to the ordered magnificence and clarity of its later wing, that built by Mansart for Philippe d'Orleans. This is the difference between the romantic mind with its love of the picturesque (oftentimes a pseudopicturesqueness) and that mentality which is the result of all the gradual affining processes of civilization. With the latter comes inevitably a feeling for fitness, simplicity, and purity of line for proper proportions; in fact, for all those elements meaning taste cultivated to its highest degree.

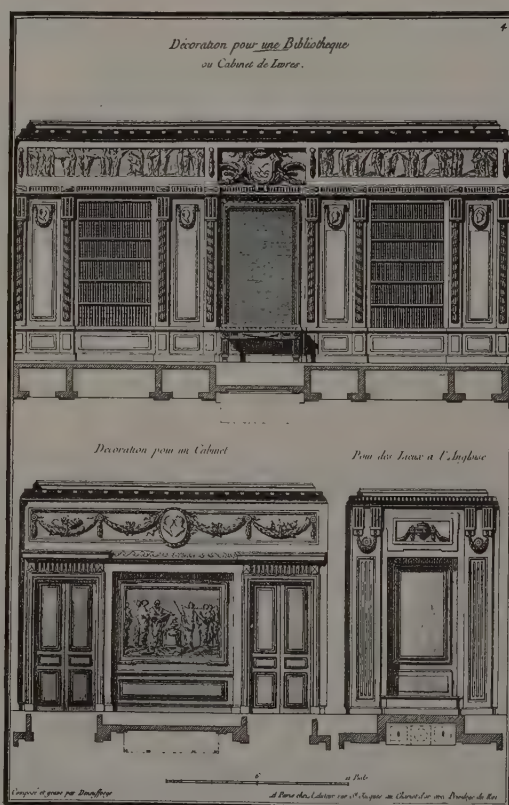
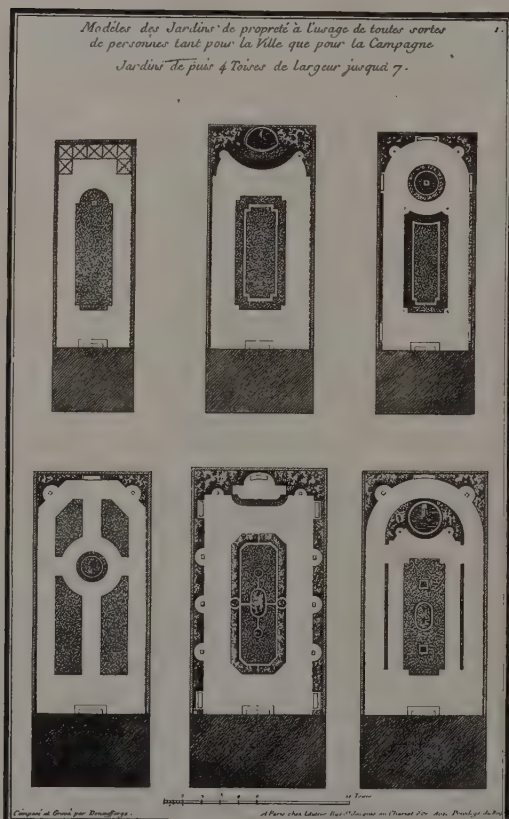
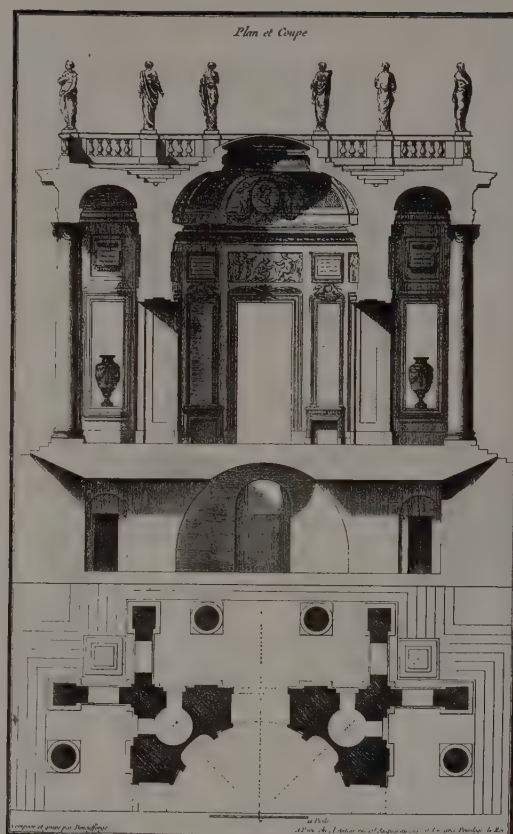
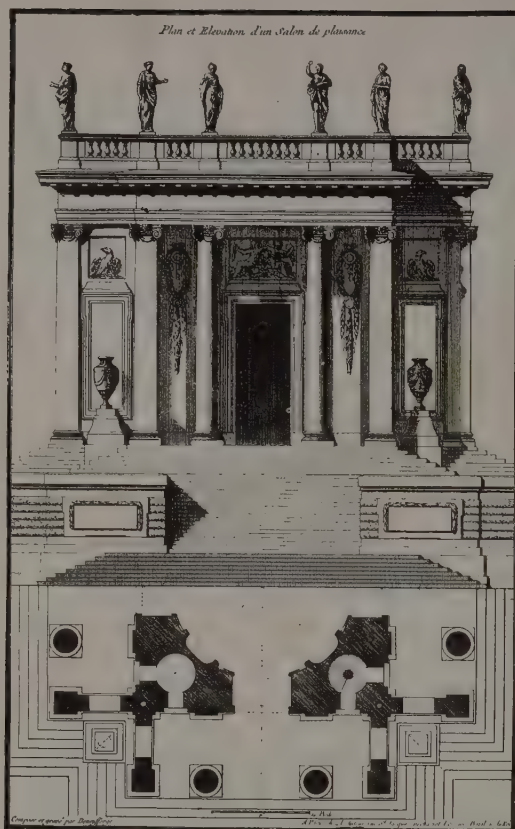
These last qualities are evident in the designs of Jean François de Neufforge, an architect who perhaps above all his contemporaries represents for us the spirit of his particular time most consistently. His name is one of the last on that list of artists who worked before the empire cast its pretentious frigidity over French art, a severity which even the prolific Percier and Fontaine failed to interpret with entire success. He bequeathed to his followers a veritable mine of inspiration and suggestion in the innumerable designs he has left to posterity.

Neufforge's "Recueil Elementaire d' Architecture" is a complete résumé of the style of Louis-Seize in architecture as well as in interior decoration. This stupendous work consists of eight volumes, the first having been begun in 1757 and the last finished in the year 1768. In its pages are to be found designs for every imaginable kind of edifice, from palaces and theatres down to the humblest dwellings. Neufforge was really the Du Cerceau of his day. His books are an invaluable aid and asset to the architect, particularly so as the houses therein can be most easily adapted to modern uses, while the elevations themselves are so logical as to necessitate very often no change whatever. They personify very strictly all the characteristics of the style of their epoch, which, through its practicability and beauty, has become one equally of our own time. French architec-











ture toward the close of the eighteenth century was no longer in any sense in a period of transition. Its forms were definite and the manner into which it deteriorated during the succeeding régime was more a "pastiche" than a continuation.

Neufforge's drawings are always structural and geometrical; his plans as a rule rectilinear. The curves so descriptive of the preceding style were transformed by him into straight lines, lines carried through with the least possible interruption, Soufflot and Oppenordt, and very often Gabriel, disguised and rounded their angles. Their successor returned to definite corners and ceased as well to use broken pediments generally. Cartouches were no longer introduced to vary the severity of cornices, friezes, and balustrades. Swags were replaced by looped-up drapery; urns of severely classical outline were introduced in decoration instead of the vases from whose openings sprays of sculptured leaves and flowers or stone flames burst forth in rococo convolutions. Rotundas and semicircular porticos, however, were not neglected by Neufforge, features of which our own modern American architects have yet to realize the beauty and effectiveness. Bellanger, perhaps the most popular architect of his day, used this last form of design far more frequently than Neufforge. One of the most charming and successful rotundas imaginable is the one incorporated by the former in the celebrated pavilion at Bagatelle.

We can learn many lessons from Neufforge's designs—lessons concerning not only taste but also teaching us to make life more agreeable as well as more beautiful.

In most American towns houses seem to be planned and built to give their inhabitants the least possible privacy both from within as well as from without. In many cases this could be changed by a simple method, merely in turning the house around, as it were; by having its principal living and drawing rooms facing the back yard, transformed into a garden, while the kitchens and its adjacent rooms look out into the street. Particularly could this be easily done in the lesser towns, where space is plentiful. In a city as congested as New York it is difficult to alter the established order of things, although it is probably the only town where this kind of planning has been attempted, and very successfully, quite latterly. There, of course, one has the disadvantage of a hideous view—the ugly backs of adjoining houses—although when one considers the streets themselves this is but a choice of evils, and time might gradually transform the rear view into one of agreeable façades and contiguous gardens.

Everything, after all, must have a beginning; Rome was not built in a day. As to the garden question, it would be hard to improve on Neufforge's designs, more particularly those intended for limited areas—a sphere of landscape gardening in which the French have ever excelled.

In other towns this system could be very easily adopted. New localities are constantly springing up on the borders of

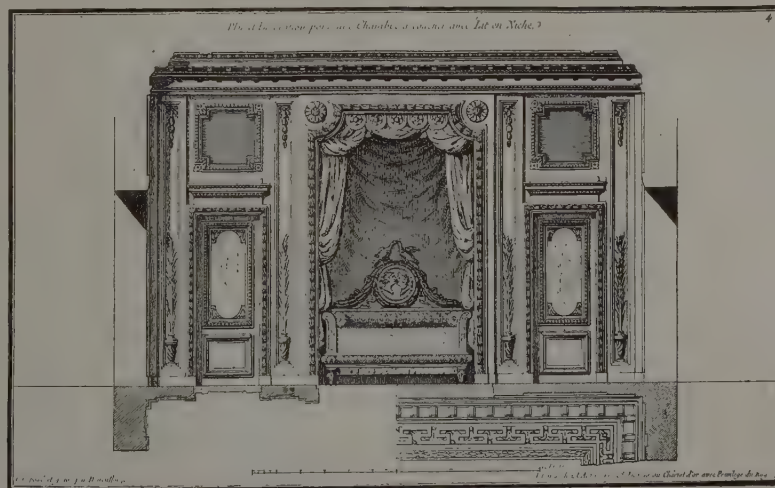
already settled districts and nothing could be simpler than a reversal of the crude, superannuated, and uncomfortable plan of the usual American house. In a recent modernization of one of Neufforge's plans, the reception-rooms of the house are shown giving out on a walled garden. Of course in a great many American communities a wall would still be considered immoral; a kitchen facing the street would be thought an utter absurdity, except perhaps by the cook! The neighbors could not be regaled by the edifying sight of a family sitting around the indefatigable victrola in full view of the entire street, when hot weather makes it necessary to keep the windows open and to draw aside concealing curtains.

It is obvious that this system could be used in small as well as in great houses. It is a plan which need not by any means apply solely to mansions and palaces.

In regard to more expensive houses, a type which is practically never met with in this country is that called by the French a "pavilion," but which was in reality a very complete residence planned to give the effect of a retreat rather more than a habitation. These smaller houses became known in eighteenth-century Paris by the name of "Folies," a term which implies phantasy more than folly. Many of them, built by Bellanger, Ledoux, or Brongniart, were models of what a medium-sized dwelling should be. Architecturally they played a most important rôle in eighteenth-century construction. Neufforge has left us many designs for this style of building, designs which could profitably be adapted for residences in the more formal resorts, or in towns such as Washington, where it is still possible to build a house entirely surrounded by a garden.

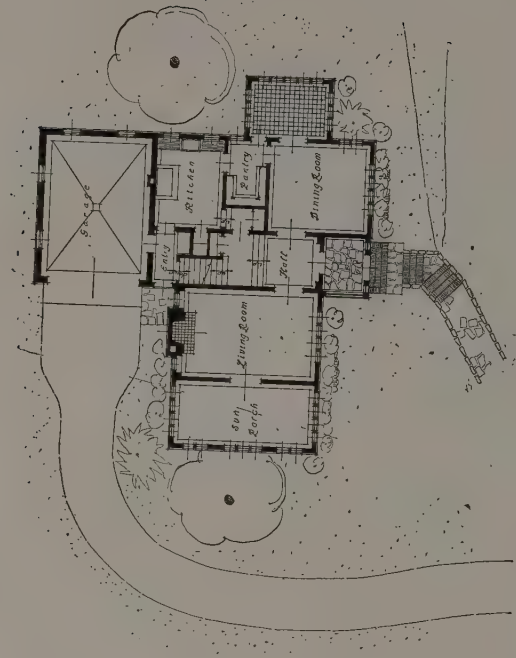
Where detached building is impossible it is to be regretted that a uniformity of height and general design could not be arrived at in city planning, although it is evident that, to put such a measure through, civic governments would have to adopt means which the general American public could not fail but to regard as coercive. The magnificent London squares, notably those planned and carried out by the Brothers Adam, are perfect examples of a general scheme of architecture applied to numerous separate dwellings. The Place Vendôme is the most beautiful and imposing expression of such a system. But America is, though infinitely the most progressive, yet still the least civilized of the great nations, and the average citizen of this country would hardly consent to have a house on which he had spent some of his hard-earned money a factor in any general scheme instead of a unit in itself. This cannot be expected until,

through generations of affinement, a higher vision has been developed. But not until then will the American town have any coherent architectural value, nor will it seem to future generations to have ever been a place inhabited by others than the heterogeneous. At present there is something distinctly distressing in the impression of disorder created from the architectural chaos of our streets.



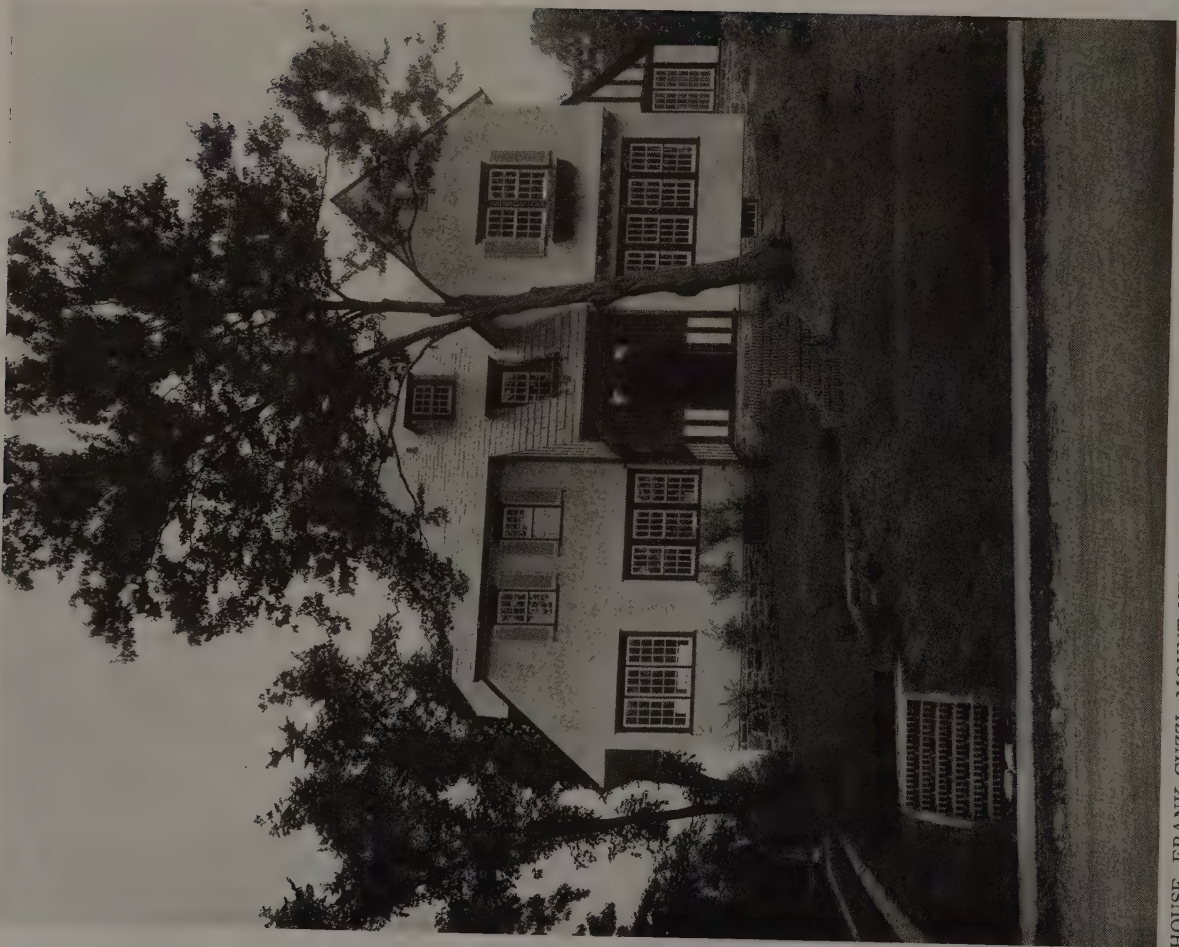


Second floor plan—  
0 10 feet



First floor plan—  
0 10 feet

S. A. Guttentberg, Architect.



HOUSE, FRANK CUZZI, MOUNT VERNON, N. Y.



# Construction of the Small House

By *H. Vandervoort Walsh*

Instructor, School of Architecture, Columbia University, New York

## ARTICLE XVI

### PAINTING AND VARNISHING THE HOUSE

**A**CTUALLY the process of varnishing or painting the woodwork and metalwork on the house is the spreading of a thin protective coat, one-thousandth part of an inch thick or less, over the surface in order to protect it from the wear and tear of use and weather and decay. And a marvel it is that any material could be found which, spread in so thin a film, could withstand the chemical action of the sun's rays, the expansion and contraction of the surface over which it is laid, the abrasive action of blown sand, hail, and rain, the natural wear of walking feet and rubbing clothes and bumping furniture, and a dozen other accidents which conspire to mar the surface of woodwork in the home.

Is it a wonder that for this protective coat of varnish all experts demand that the best materials be used? But out of ignorance it is not always so, for the lower cost of varnish and paint is more evident than the quality of the substance of which they are made.

The varnishes which are most used in good houses are made of resins, melted in a kettle and mixed with linseed-oil, and thinned with turpentine as they cool. They have the peculiar property, when spread with a brush over a surface, of hardening by a chemical change brought about by absorbing oxygen from the air, and making a strong, transparent, protective coat over the substance upon which they have been applied. The kind of resins\* have much to do with the quality of the varnish, since the linseed-oil and turpentine are apt to be about the same grade in all varnishes. Dark or light varnishes can be made; hard or soft and elastic surfaces can be produced; varnishes capable of resisting the wettest kind of weather and those which turn white under the least dampness are manufactured for various purposes, and practically in all cases those varnishes which are the best are the highest in cost.

The cheap varnishes which are the most abundant upon the market, and which are used for cheap furniture and houses, are made of rosin and not resin, or are resin varnishes adulterated with rosin. Most houses, erected by speculative builders are finished with cheap rosin varnishes, but no architect should be guilty of specifying them, for he should know better than to attempt to save money by purchasing the poorer grades of varnishes, since the real cost of varnished work is in the labor rather than in the cost of the materials used. These cheap rosin varnishes cannot stand up under the sponge test, which is merely the application of a wet sponge to the surface overnight. The next morning the rosin varnish will be found to be white and dissolved down to the wood, and will never recover its appearance. Better grades of varnish may turn white under this sponge test, but upon drying return to their original color, but the finest grades of varnish will not be affected at all. The difference between these varnishes can also be observed by rubbing the thumb over the surface of such a fine varnish as is on a piano and noticing that no effect other

than a higher polish is produced, while if the same rubbing is done on a cheap varnish, it will be crumbled off from the wood. Every one has seen the ugly surface cracks which develop with age in old doors or upon old church pews in musty churches of the dark ages of American architecture. In nearly all cases these cracks are due to cheap rosin varnishes.

Before varnishing or painting any interior woodwork, it is important to observe all the preliminary precautions, or else failure may result, even though the work is conscientiously performed in the latter stages. One of these early precautions is to paint the back of all trim for doors and windows with some good linseed-oil paint, and apply a first coat of filler to the outside surface, and all this as soon as it arrives on the job. This is to prevent the wood from absorbing the dampness which is prevalent in all new buildings, and as most trim has been kiln-dried beyond ordinary requirements for construction work, it is very thirsty for water, and will soak it up quickly from the atmosphere. This trim should not be permitted to stand in the building overnight without the priming coat. As the first coat of filler is linseed-oil, there is not much excuse for not doing this, for it can be applied very rapidly. Of course, where the wood is to be stained with an oil stain, the application of the linseed-oil before the stain is applied will prevent the proper penetration of the stain into the wood, and as the architect generally insists upon seeing samples of the staining work before it is applied, the above precautions of protecting the wood as soon as it comes are often thrown to the winds.

And in connection with this matter of stains, a word may not be amiss. Most manufacturers make among their many stains certain brilliant-red mahogany colors, bright Irish-green colors, and horrible yellows. These are made to meet certain gaudy tastes shown by the public, but of their use by architects no word could condemn them enough. And on a par with these stains is the varnishing with no stain at all of yellow-pine trim, an architectural atrocity which is committed on every hand in small houses. The quiet browns, grays, grayish greens, and the like are the only safe ranges of color for staining interior trim, for, after all, the casing of doors and windows must blend in with the walls and serve as a background for the furniture and not screech at it. And directly in line with this statement should be emphasized the rule that highly polished surfaces in varnishes for trim are as much out of place as brilliant colors. Many architects prefer wax in place of the polish of varnish, and with good reason. The manufacturers of varnishes make certain grades which dry with a dull finish, and also show samples of beautiful dull finishes which can be secured by the laborious method of rubbing the final coat of varnish with powdered pumice-stone, water, and felt.

But before any varnishing can be done, and for that matter any painting, it is essential that the pores of the wood are filled, so that the surface to be varnished has no soft and absorbent places, but presents a hard and glossy body. Woods like oak, ash, and chestnut have such large pores that paste fillers are required to fill them in. These paste

\* Varnish resins or gums are imported from countries that the average man knows little about. The island of Zanzibar furnishes one of the costliest and finest of gums. It is called Zanzibar copal and is the gum of a fossil tree. New Zealand furnishes the most widely used gum, kauri. It is dug out of the ground by the natives. The west coast of Africa furnishes the gum known as Sierra Leone copal, which is used much in automobile work.

(Continued on page 68)

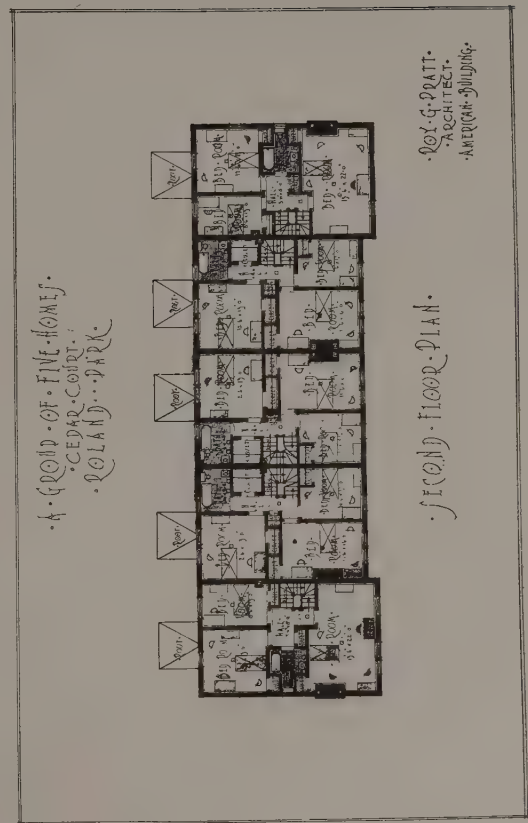
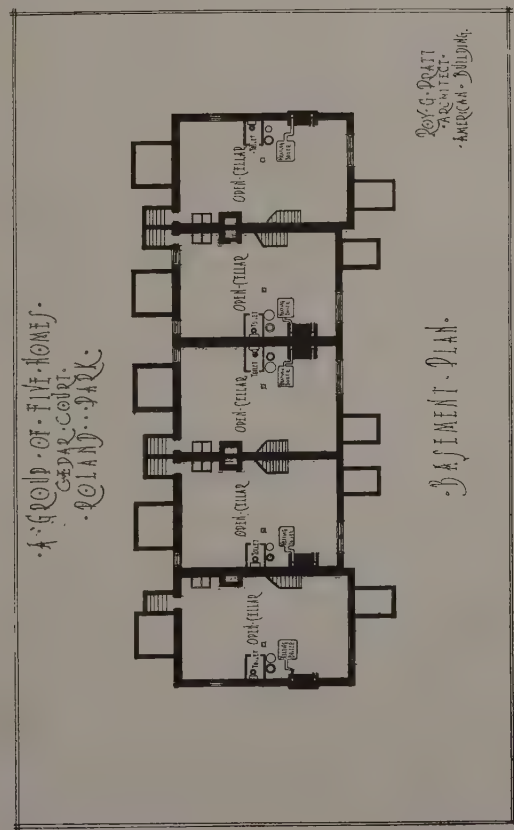
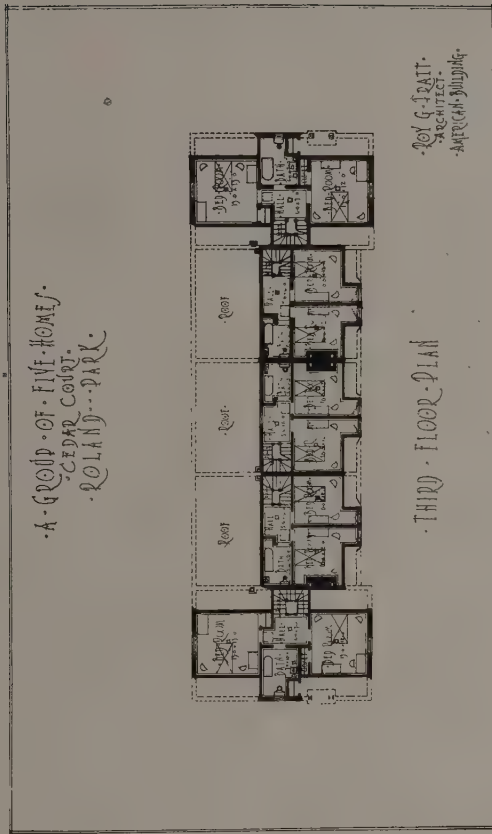
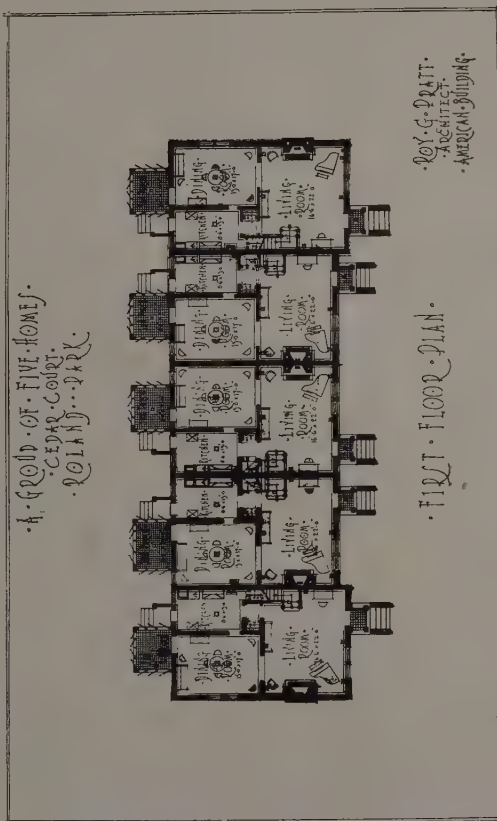




A GROUP OF FIVE HOUSES, CEDAR COURT, ROLAND PARK, MD.

Roy G. Pratt, Architect.





(Continued from page 65.)

fillers consist of a solid part like pulverized quartz and a liquid part of a quick-drying varnish. It is rubbed over the surface of the wood and into the pores and permitted to set, when the excess is then wiped off with excelsior and, finally, felt. When the wood is stained with an oil stain, this filler may be colored to match.

Architects are often shown samples of the beautiful finishes which are possible with the use of this or that manufacturer's stains and varnishes, and supplied with specifications by which they are told they can secure these finishes, but much to their sorrow the results are not like the samples, and probably never will be. All of these samples are made under ideal conditions by the most careful experts. Laboratory conditions and regularity and first-class skill can produce finishes on a small sample board which could not possibly be reproduced in a building except at enormous costs. In the first place, there is always more or less dust blowing around in a newly constructed building, and not the greatest care is taken in it to provide the exact control of humidity and temperature required for drying varnishes. And as every one knows, the men who do the painting are generally far from being the most skilful artisans of their trade. It, too, is a big temptation to put on one or two heavy coats of varnish instead of three or four thin coats, and there is not an expert living who can tell how many coats of varnish are on a piece of wood after the work is done. Unless the architect has observed each step of the application, he cannot deny, when the painter shows him the finished wood-work, that there are not as many coats of varnish on it as he required in his specifications. Yet time will tell the tale, but then it is too late.

However, the treatment of floors and stair treads is the worry of many an architect, although he ought to remember that in factories sheet steel is laid on the floors at the doorways, and even this wears through. Why should he be disheartened if after a year the stair treads and the patches of floors near the door-sills are scratched down to the wood through coats of varnish one-thousandth of an inch thick? Even the best varnish will break down under this abrasion, but only the best should be used. Cheap floor varnishes are not worth the labor of laying, and yet how many spend money on them. Some architects, and with good reasons, prefer finishing the floors with wax instead of varnish. As a base for this wax, a thin coat of varnish is excellent. Various manufacturers have different formulas for floor waxes, and they are more or less complex, but generally turpentine is the softening and drying material. The wax paste is rubbed into the floor and polished with weighted brushes—a tedious job. However, it is a job which any servant or housewife of ordinary intelligence can perform, so that whenever the floors become worn around the doors or the stair treads become shabby, the housekeeper is able to repair them easily, and there is no doubt that a waxed floor is more beautiful than a varnished one. But remember the slipping and sliding rugs on a wax floor and be sure to fasten them down.

When examined critically, paint is not much more than a varnish with a finely ground opaque powder, called the pigment, suspended in it. This pigment takes away the transparent qualities of the varnish and gives a definite color to the surface. Enamels actually do use varnishes as their vehicle or base, but ordinary paint uses linseed-oil, which acts much like a varnish, in that it has the property of becoming hard and elastic under the oxidizing effect of the air.

The exteriors of most houses are painted with white lead or zinc-white pigments mixed with linseed-oil. Zinc

makes a harder paint than white lead, but it is best to mix the two pigments together in the proportion of one-third of zinc to two-thirds of white lead.

In extensive investigations the U. S. Bureau of Standards suggests that much saving of money in paint would be made if white paint were abandoned altogether in favor of dark-colored pigments for exterior use. Horrible suggestions, but these are the facts in the case! White and light-tint paints invariably fail on the south side of a house, before the paint on the other side shows signs of deterioration. This is because the light of the sun breaks down the strength of the linseed-oil, which is the body of the paint film. For this reason dark pigments, which are more opaque, cut off the light and protect the oil film more than the lighter-colored pigments.

Another common cause of failure in exterior painting is the application of it to the wood during unseasonable weather, when the surface of the wood is wet. Paint will only properly adhere to a wood surface when it is free of any moisture.

Another one of the causes of failure of lead and zinc paints for exterior work suggested by some authorities is the use of volatile thinners like turpentine and benzine. They say that such thinners should not be permitted on the job, for they are a temptation to the painter. If raw linseed-oil is used, and it is necessary to shorten the time required for drying, some good drier should be added, say five per cent. This drier should be pale in color and free from rosin. Driers are usually made of oil combined with a good proportion of lead and a little of manganese.

White pine, Douglas fir, yellow pine, cypress, or any of these woods usually contain some knots, which are sure to damage exterior white paint unless properly treated. These knots have a certain amount of pitch in them, which will penetrate through any oil paint and leave an ugly mark. They should be covered with shellac, which is not affected by the pitch. Shellac is a spirit varnish made from shellac resins dissolved in alcohol. The yellow shellac is the strongest, but the white is used where a light-colored paint is to be applied on top of it. The pitch which is so bad in knots is often distributed throughout the wood, as in Southern yellow pine, and this will often cause the paint to peel off. To prevent this to a certain extent, some specifications advise using benzol in the priming coat, in order to make the paint penetrate more deeply into the wood and get a better grip on the surface.

The priming coat of any painting job should either be pure linseed-oil or linseed-oil with very little pigment in it. Its purpose is to fill the pores of the wood before the other coats are applied, for if an ordinary thick coat of paint were applied to raw wood, the surface would draw so much oil out of the film of paint that most of the pigment would be left dry and unfastened upon the outside.

Only after the wood has been given the priming coat is it then time to putty up the nail holes and other defects, and not before, because the dry wood, as in the case of paint, will suck out the oil from the putty and leave it without anything to bind it together. The best putty for this work is made of linseed-oil with enough white lead in it to make a thick paste. The putty which is commonly used, however, is made of whiting or ground chalk mixed with linseed-oil. This is durable if real linseed-oil is used, but often some inferior adulterant is substituted.

After the holes are all puttied, the other coats of paint may be added. At least two good coats should be applied, and three coats give superior results. Plenty of time should be allowed between coats to permit thorough drying of the previous one.



# Concrete Construction

By DeWitt Clinton Pond, M.A.

## TENTH ARTICLE

IN view of the fact that the following articles will deal with such kinds of flat-slab construction as are found in the 395 Hudson Street Building, which was designed to conform with the New York law, the present article and the one following it will deal with this type of construction in a general way. In them particular reference will be made to the rules embodied in the metropolitan ordinances.

The Board of Standards and Appeals of New York, on July 8, 1920, adopted rules covering the design of reinforced-concrete flat slabs. As almost all engineers are forced to abide by building ordinances of one kind or another, the rules governing design in New York will form a fair basis for comparison with the regulations of other cities, and an explanation of certain of the passages will tend toward an understanding of flat-slab construction on the part of the student.

The rules apply to "the design of reinforced-concrete flat slabs" used as floors or roofs, but which must consist of "three or more rows of slabs, without beams or girders, supported on columns, the construction being continuous over the columns and forming with them a monolithic structure."

A floor such as shown in Fig. 1 would conform to this rule, as it consists of three rows of slabs and can be designed without beams and girders.

The fourth rule stated in the code deals with the allowable stresses in concrete, but before discussing this it may be of advantage to investigate the proportions and kind of columns required to support flat slabs and note the points at which the stresses are allowed.

It will be noted in Fig. 1 that the columns are spaced 20 feet on centres and that the panels are square. The reason for spacing the columns as shown will be considered later when slab design is investigated. According to Rule 5 the least dimension of any column shall be not less than one-fifteenth of the average span of any slabs supporting it,

but in no case shall the least dimension of an interior column be less than 16 inches and of an exterior column be less than 14 inches. In the cases of columns 17, 18, 21, and 22 in Fig. 1, the diameters of these supporting members cannot be less than one-fifteenth of 20 feet, or 1 foot 4 inches. Had the span been less than 20 feet the columns would have the same diameter, for, according to the rule, this dimension

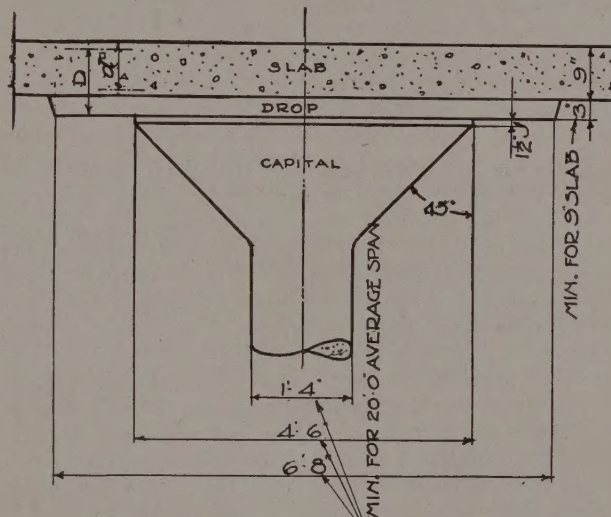
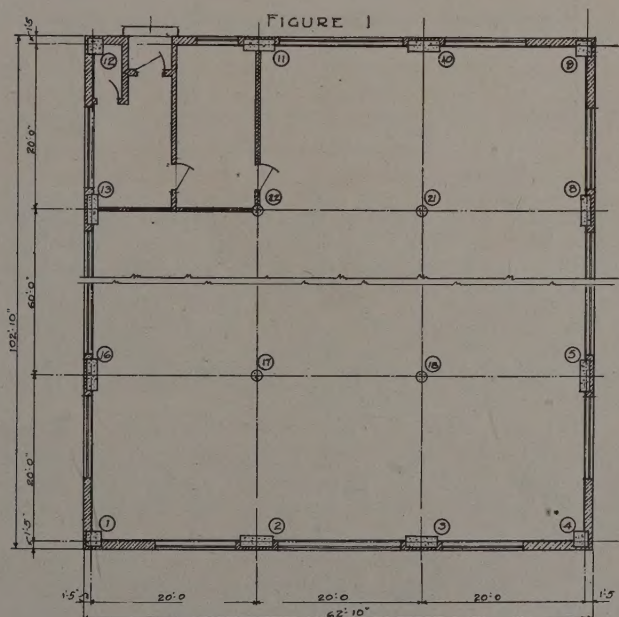


FIGURE 2

could not be less than 16 inches in any case. If the panel had been rectangular, measuring 20 feet by 25 feet, the average span would have been 22.5 feet and the diameter of the column would be at least 1 foot 6 inches. The rules illustrated above also apply to the least dimension of an exterior column except that the minimum dimension is 14 inches.

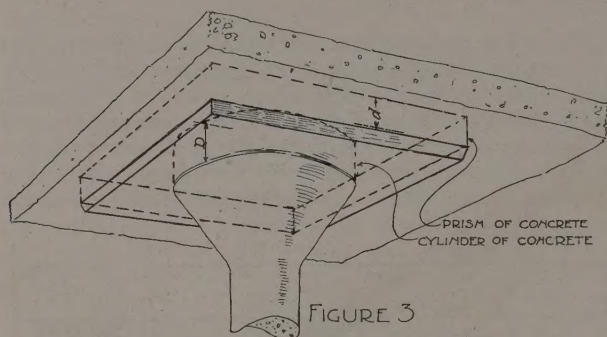
The figures given are minimum dimensions. It is quite possible that the load on any one of the columns may be large enough to require more concrete in the column than would be found in case the minimum figures were the determining factor. The determination of the diameters of columns for the purpose of supporting loads is carried out in the usual manner. The reinforcement in the interior columns is ordinarily made up of spiral and vertical steel rods and bars, and the reinforcement of exterior columns is in general made up of vertical rods and hoops.

However, in flat-slab construction the columns have capitals and "drop panels" which are not found in connection with columns supporting beams and girders. The capitals are placed on the columns in order to prevent the columns from being punched through the floor. They and the drop panels above them may be considered as spread footings turned upside down. Instead of preventing the punching of the columns into the ground, they are used to prevent the floor or roof from being pushed down and around the columns. Now according to Rule 6 "every reinforced-concrete column, supporting a flat slab, shall be provided with a capital whose diameter is not less than 0.225 of the average span of any slabs supported by it." This diameter "shall





be measured where the vertical thickness of the capital is at least  $1\frac{1}{2}$  inches, and shall be the diameter of the inscribed circle in that horizontal plain." Fig. 2 shows the elevation of such a capital and its least dimensions, based upon the assumption that the column is one of the four interior ones



shown in Fig. 1. It will be noticed that the diameter of the capital is 4 feet 6 inches at a point  $1\frac{1}{2}$  inches below the drop panel, and that this dimension is obtained by multiplying 20 feet by 0.225. Rule 6 continues: "The slope of the capital, considered effective below the point where its diameter is measured, shall nowhere make an angle with the vertical of more than forty-five degrees." This angle is shown in the figure, and the reason for this requirement is that, were the capital flatter, there would not be enough concrete around the column to prevent its punching through the capital, drop panel, and floor. There is a provision made in Rule 6 for considering as part of the column capital a portion of the drop panel inclosed within the lines of the column capital, provided the drop panel is smaller than required in the following rules. This provision need not be considered at the present.

The drop panel is described in Rule 7. It is not necessary to have a drop panel above a capital, but the slab thickness is less when the drop is used and the positive moment in the outer section is less. Therefore, although there are obvious advantages in maintaining a flat ceiling without drop panels, many engineers use them because of the economy effected. The width is determined by "the shearing stress in the slab around the perimeter of the drop, but in no case shall the width be less than 0.33 of the average span of any slabs of which it forms a part." In the case of the interior columns in Fig. 1, the width of the drop panel cannot be less than 6 feet 8 inches. When the allowable stresses are considered, the width of the drop panel will be investigated further.

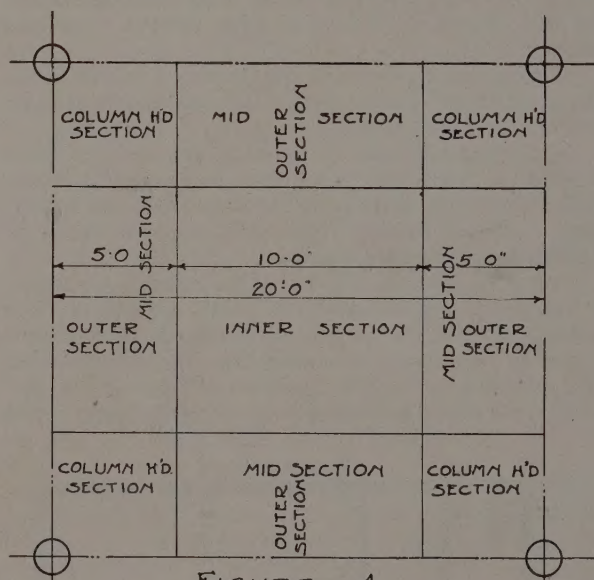
The thickness of the drop is determined upon the basis of resisting the punching of the column capital through the drop panel and the floor, and also upon the basis of providing allowable compressive stresses in the concrete in resisting the negative moment on the column head. In no case shall the thickness of the drop be less than one-third the thickness of the slab. In case the slab is a 9-inch slab the drop cannot be less than 3 inches in thickness. Drops over exterior columns must extend to the one-sixth point in the panel from the centre line of the column.

To return to Rule 4, there are two values of unit shear allowed in flat slabs.

The first value is given for the concrete in the slab directly above the circumference of the column capital. If the capital were punched through the floor and drop panel it would push out a cylinder of concrete. The cylinder would have a diameter equal to the diameter of the capital,

and would have a height equal to the distance from the under side of the drop panel to the centre of the reinforcing steel. This distance is marked  $D$  in Fig. 2. The shearing value of the concrete around the circumference and for the total height is given as 120 pounds per square inch. If the slab is 9 inches thick and the drop is 3 inches thick, the total depth will equal 12 inches. Subtracting  $1\frac{3}{4}$  inches as the distance to the centre of the steel,  $D$  becomes  $10\frac{1}{4}$  inches. The distance around the circumference at the top of the capital such as shown in Fig. 2 is 170 inches,  $D = 10\frac{1}{4}$  inches, and the area of concrete sheared out is 1,743 square inches, and the supporting value, as far as the allowable shear is concerned, can be found to equal 209,160 pounds. The diameter of the capital is determined as the least allowed for a square panel measuring 20 feet on a side, and it will be found that such a panel will have to be loaded very heavily to produce a shearing stress as large as the one found above.

The second value given for allowable shear is in reference to the concrete directly above the drop panel. Should the drop panel be punched through the slab, a square prism of concrete would be pushed out with a base the size and shape of the drop and a height equal to the thickness of the slab. When the shearing value of the slab is considered, the effective depth, or  $\frac{7}{8} \times D$ , is used.  $D$  in this case is  $7\frac{1}{2}$  inches when allowance for fireproofing is made. The area



of sheared concrete would be for a drop panel 6 feet 8 inches square,  $80 \times 4 \times \frac{7}{8} \times 7\frac{1}{2} = 2,100$  square inches. The allowable shear around the perimeter of the drop is 60 pounds on the effective area, so the total shear around the drop shown in Fig. 2 is 126,000 pounds. This is less than the allowable shear around the column capital, but even in this case the load would have to be large in order to make it necessary to increase the size of the drop.

The only other allowable stress referred to in Rule 4 is the unit compressive strength of concrete at the column head, which is given as 750 pounds per square inch. Reference will be made to this in connection with the design of the slab itself.

So far the minimum dimensions of the column capital have been established, the minimum width and thickness of the drop, and the allowable shearing stresses in the slab at



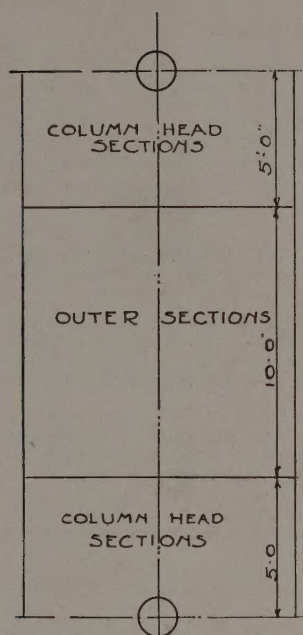


FIGURE 5

the column capital and around the perimeter of the drop, as well as the compressive value of concrete at the column head. The next step will be the determination of the thickness of the slab and the methods used in designing the reinforcing.

According to Rule 8, "the thickness of a reinforced-concrete flat slab shall be not less than that derived by the formula  $t = 0.024 \times L \times \sqrt{w} + 1\frac{1}{2}$  for slabs without drops, and  $t = 0.02 \times L \times \sqrt{w} + 1$  for slabs with drops, in which  $t$  is the thickness of the slab in inches,  $L$  is the average span of the slab in feet, and  $w$  is the total live and dead load in pounds per square foot; but in no case shall the thickness be less than one-thirty-second ( $\frac{1}{32}$ )

of the average span of the slab for floors, nor less than one-fortieth ( $\frac{1}{40}$ ) of the average span of the slab for roofs, nor less than 6 inches for floors, nor less than 5 inches for roofs." In order to show how the formula, which is given above, is applied it will be necessary to assume some loads and apply them to the floor panels shown in Fig. 1. If the slab is 9 inches thick the dead load per square foot is 108 pounds for the slab alone. Assuming a dry-cinder fill of 2 inches weighing 10 pounds and a 1-inch cement finish weighing 10 pounds more, the total dead load equals 128 pounds. The live load can be taken as 250 pounds per square foot, and the total dead and live loads will be 378 pounds, or 380 pounds per square foot in even figures. As the bays are 20 feet square, the average span is also 20 feet, and with these values it is possible to substitute in the formula in order to find the thickness of the slab. In the case of a slab without drop panels the thickness becomes  $t = 0.024 \times 20 \times \sqrt{380} + 1\frac{1}{2} = 10.86$  inches. In the case of a slab with drop panels the thickness would be determined as follows:  $t = 0.02 \times 20 \times \sqrt{380} + 1 = 8.8$  inches. It can be seen that the slab must be made about 2 inches thicker if drop panels are not used.

If the load had not been as great, it is possible that the thickness of the slab would have been determined by the fact that the slab must be one-thirty-second of the average span. This ratio in the present case would give thickness of 7.5 inches.

There are in all fourteen rules, and of these the first eight have been referred to. Before discussing Rules 9 and 10, dealing with Reinforcement and Line of Inflection, Rule 11, covering Moment Sections, should be investigated.

For the purpose of design a panel is divided into sections as shown in Fig. 4. The sections are included between imaginary lines which are assumed to run parallel with the column centre lines and, at distances equal to one-quarter of the space between columns, on either side of the centre lines. If  $L$  is taken to represent the distance between columns, then the dividing lines are located at distances equal to  $\frac{1}{4} \times L$  on either side of the column centres. In the present case the lines are located 5 feet away from the columns.

The different sections—separated by the imaginary lines—are designated by special names in the code, as shown in Fig. 4. The section directly in the centre of the panel is known as the inner section. The sections directly over the columns are known as column-head sections, and the sections not designated as above are known as mid-sections, or outer sections, depending upon the direction in which the reinforcing is being designed.

It is somewhat difficult to explain just what is meant by two designations for the same section. In Fig. 5 a strip of the panel is shown. At each end are two column-head sections and in the middle are two outer sections. In this strip or band the steel is designed so as to be placed longitudinally with the band. The steel in the two column-head sections would have to resist a negative moment, the steel in the two outer sections would have to resist a positive moment. When the reinforcing bars are designed for such a band, formulas are given in the rules for the negative moment in the column-head sections and for the positive moment in the outer sections.

Fig. 6 shows a strip which does not touch the columns but runs directly through the centre of the panel. It includes the inner section and mid-sections at each end. The mid-sections overlay the outer sections of the bands which run between the columns, and it can be seen that when the steel in the mid-section overlaps the steel—at right angles to it—in the outer section, there is a negative moment at this point. The moment in the inner section is always a positive moment.

It will be seen that column-head sections are always designed to resist negative bending, as are also the mid-sections, but the inner sections and outer sections are designed to resist positive bending.

The steel in the bands running from column to column

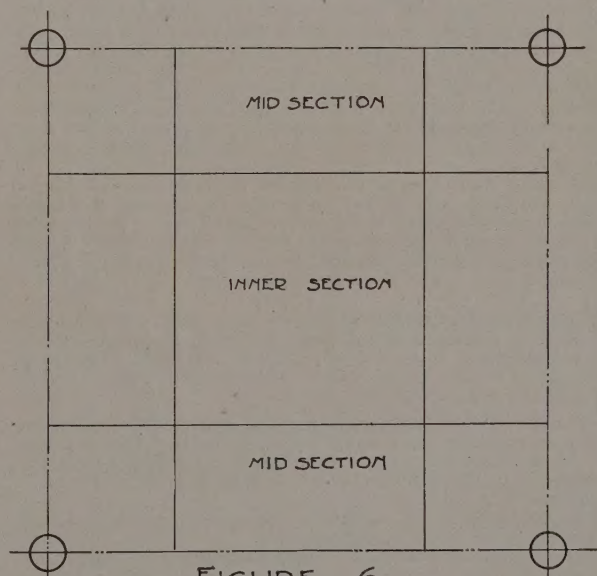


FIGURE 6

is known as *band steel*, and the steel running from the mid-section to the inner section and then to the next mid-section is called *slab steel*. The inner section is looked upon as a kind of suspended panel supported by the bands.

In the formulas applied to the design of slab, steel will be discussed and a comparison will be made between two and four way reinforcing.



## Book Reviews

**SMALL HOUSES.** Their Economic Design and Construction. Essays on the Fundamental Principles of Design and Descriptive Articles on Construction. With Plates Drawn by the Author, Illustrating Methods and Results. By ERNEST FLAGG, architect. Large folio. Charles Scribner's Sons, Publishers, New York.

There is a certain kind of courage involved in all innovations, and in perhaps no other profession is this more true than in that of architecture. In his preface Mr. Flagg says, "Those who object to new methods simply because they are not accustomed to them will have little use for this book," but in this very statement he piques curiosity and leads his readers to seek an understanding of the new and economical methods he writes about and makes practically manifest in the text and numerous drawings and photographs with which this handsome book is illustrated.

Even a cursory look at the houses, placed, as they are, in their natural environment of garden or village street, excites pleasurable interest. They have the appeal that belongs to fitness, to a well-ordered arrangement of simple elements. You are immediately struck with the absence of ornament, with the lack of any salient features that might class them with a particular period or style. One will think of certain French originals, mayhap, and, if so, of the simple country houses of the smaller French towns.

The essential feature of Mr. Flagg's designs is their individuality, based upon his own theories of plan, and especially their economic and time-saving new methods of construction. The walls of these houses are built of mosaic rubble, and the method of building them as shown and explained in full is obviously a means of great economy in both labor and time.

The author emphasizes the fact that the most important deviation from ordinary methods which these designs illustrate is the use of ridge-dormers, or their equivalent, ridge skylights, and the various consequences arising therefrom. Instead of being gloomy, stuffy, and hot, the dormers render the space under the rafters, perfectly ventilated, light at all times, and cool in hot weather. These ridge-dormers are made possible by the strength of the rubble-stone walls where no tie-beams are needed. In summer the ridge-dormers keep the house cooler; in winter, when closed, they help to add cheerfulness and light. There are sectional drawings showing the placing and proper construction of these dormers.

Mr. Flagg begins by explaining his use of his "The Module System in Construction" and "The Module System in Design." The chapters on Windows, Roof-Covering, Foundations and Cellars, Repairs, Trim, Casing and Doors, Concrete, Carpentry, Heating, Floors and Ceilings, Standardization, Hardware, Plumbing and Drainage, Roof Framing, Gutters, Leaders, Skylights, Half-Timber and Plaster Work, Fireplaces, Stairs, Repairs, will be read with interest and profit. Many readers also will enjoy following Mr. Flagg in the more or less abstract essays included among these purely practical matters, giving his theories and conclusions on art. We may read of Truth, Beauty, Proportion, Fitness, Unity, Artistic Convention, Decoration, Ornament, Simplicity, Certainty, Color Drawing, Symmetry, Order and Balance, and come to the conclusion that, after all, it is upon these purely æsthetic approaches to the practical that we must base our judgments of all architecture, determine what is tolerable and desirable, what is good or bad.

The many illustrations in pen and ink are both practical and picturesque, and many will, we feel sure, enjoy the pleasant and home-like human note introduced in the way of small figures, for which the author makes grateful acknowledgment "to his daughter Betsy for the charming little people which embellish his drawings." The book is handsomely printed, and each of the large plates contains a table of modules.

**THE KIDDER-NOLAN ARCHITECTS AND BUILDERS HANDBOOK.** A Handbook for Architects, Structural Engineers, Builders, and Draftsmen. Compiled by a Staff of Specialists. THOMAS A. NOLAN, M.S.A.M., Editor-in-Chief. Seventeenth Edition, enlarged. John Wiley & Sons, Inc., New York.

The new revised and enlarged seventeenth edition of this book is now ready—prepared under the able editorship of Professor Thomas Nolan, Fellow of the American Institute of Architects, assisted by a competent staff of architects and engineers, who have personally prepared many of the articles.

This book is full of live, usable information, and every phase of building construction has been thoroughly covered.

Through years of constant use, thousands of architects, builders, and contractors have come to depend upon KIDDER and its always convenient data. From cover to cover it is authoritative and thoroughly reliable, every fact being strictly up to the minute.

**COUNTRY RESIDENCES IN EUROPE AND AMERICA.** By LOUIS VALCOULON LE MOYNE. Second Edition with Additional Material. G. P. Putnam's Sons, New York.

The author says the purpose of this book is to describe what he thinks to be "the most interesting country residences in various parts of Italy, France, England, and America." We need not say that to choose from such infinite variety means the omission of many things we should, perhaps, expect to find, but the selection includes many famous and beautiful examples. In the American section we note Mt. Vernon, Arlington, Hunnewell Place, Biltmore, Monticello, Weld, among others.

The author has included in this new edition some full-page plates in color from original paintings in water-color. They are treated in a conventionally decorative way in broad flat washes. The text consists of brief comment in large type upon each subject.

**ENGLISH HOMES.** Period V. Vol. I. Early Georgian, 1714-1760. By H. AVRAY TIPPING, M.A., F.S.A. Charles Scribner's Sons, New York.

The new volume in this sumptuous series dealing with the architecture and history of famous English homes is in keeping with those that have gone before. The text gives in brief chapters the names and records of the architects with comment on particular features and the story of the families associated with the homes.

The period included, while no doubt inspired by the earlier traditions of Palladio as exemplified in the work of Inigo Jones and others, was less governed by the restraint and consideration for a well-defined classic reserve. Everything was on a more grandiose scale, especially the details of interior decoration. Most of the work of the time came under the influence of the famous amateur, Lord Burlington, and his chief professional authority, William Kent. Horace Walpole, a man of fashion and amateur of the arts, was a prominent figure.

The most intelligent and informed members of society "placed æsthetics in the forefront of human interests and attainment."

The period was one of transition.

Gibbs and Campbell (author of "Vitruvius Britannicus"), Leoni and Kent were, in the days of George I and under the ægis of Burlington, the chief writers as well as practitioners in that very Italian style of architecture which alone they countenanced as "regular." The source of their inspiration was foreign and in large measure archaic. Their intellectual attitude was literary and doctrinaire. Their æsthetic spirit was one of choice exclusiveness and specialized artificiality. The local characteristics of landscape, climate, and material, the habits and needs of the generality of the house-holding or house-needing population must not distract them from the contemplation of the great works of Classic Rome and Renaissance Italy. Grandeur reduced to rule was their study and their aim. The word palatial appealed to them excessively. Now Wren had lived and practised at a time when, although many fine private houses were being built, the provision of public buildings, ecclesiastical and civic, occupied the architectural foreground. Such were not the great undertakings of the Early Georgian period. A wealthy oligarchy ruled the land, not merely politically but also intellectually and æsthetically. A cultured aristocracy, with whom knowledge of the arts, largely gathered by foreign travel, was a customary and expected accomplishment, had purse and power as well as desire and capacity to realize the utmost dreams of ceremonious housing and splendid living. There was no palace built for a king, but many to be provided for great landowners and millionaire merchants. These mark the period not merely by their own bulk, but by their influence over more modest contemporary dwellings. Nor can due appreciation of the architectural phase of which they are the dominant product be reached without accounting for the part played in their creation by their owners themselves or by specially informed and interested members of the society to which the owners belonged.

The illustrations are profuse and the plates are handsomely printed. This whole series should prove a valuable reference for the architect's library.

**OLD SPAIN—ARCHITECTURE AND APPLIED ARTS.** By AUGUST L. MAYER, Ph.D. With 310 illustrations. Brentanos, New York.

There seems to be rather a surprising revival of interest in things Spanish and in the past year or two a considerable number of American artists and architects have gone to Spain for study and inspiration. A series of drawings made by Vernon Howe Bailey have been purchased by the Hispanic Museum, and more recently a number of pen drawings by Ernest Peixotto. There is no dearth of information on old Spanish furniture, but comparatively little on the subjects of this profusely illustrated book. As in most books of this kind, the text is but a brief introduction. The plates are grouped under the following heads: Moorish Art, City Sites and Castles, Churches, Buildings, Furniture, Wrought-Iron Work, Precious Metals, Leather, Carpets, Stuffs, Ceramic Art, Ivory, Glass.

We cannot refrain from mentioning that the book is bound in yellow cloth with blue edges for the pages. The outside paper wrap is blue paper with the title in black. These are minor things, but we learn many lessons from just such exhibitions in the way of good taste and suitableness.

**THE HOME PAINTING MANUAL.** The Sherwin Williams Co., Cleveland, Ohio. Department B. 435. Paper Covers.

This is a useful and practical little book with many attractive illustrations in color as well as black-and-white. It deals with such matters as The Right Use of Paint, Estimating, Individual Treatment in Exterior Painting, Interior Finishing, Treatment of Floors, Color Harmony, Wall and Ceiling Treatment, Stencils. As the publishers say: "There is excellent material available treating on period furniture, decoration and color-schemes, but little telling how walls may be decorated in paint. There are histories and dissertations on the subject of well-known and rare cabinet woods, but nothing to guide one in the finishing or refinishing processes."